No. 1914 Vol. XLVIII AUGUST 30th, 1945

FLIGHT

and

AIRCRAFT ENGINEER

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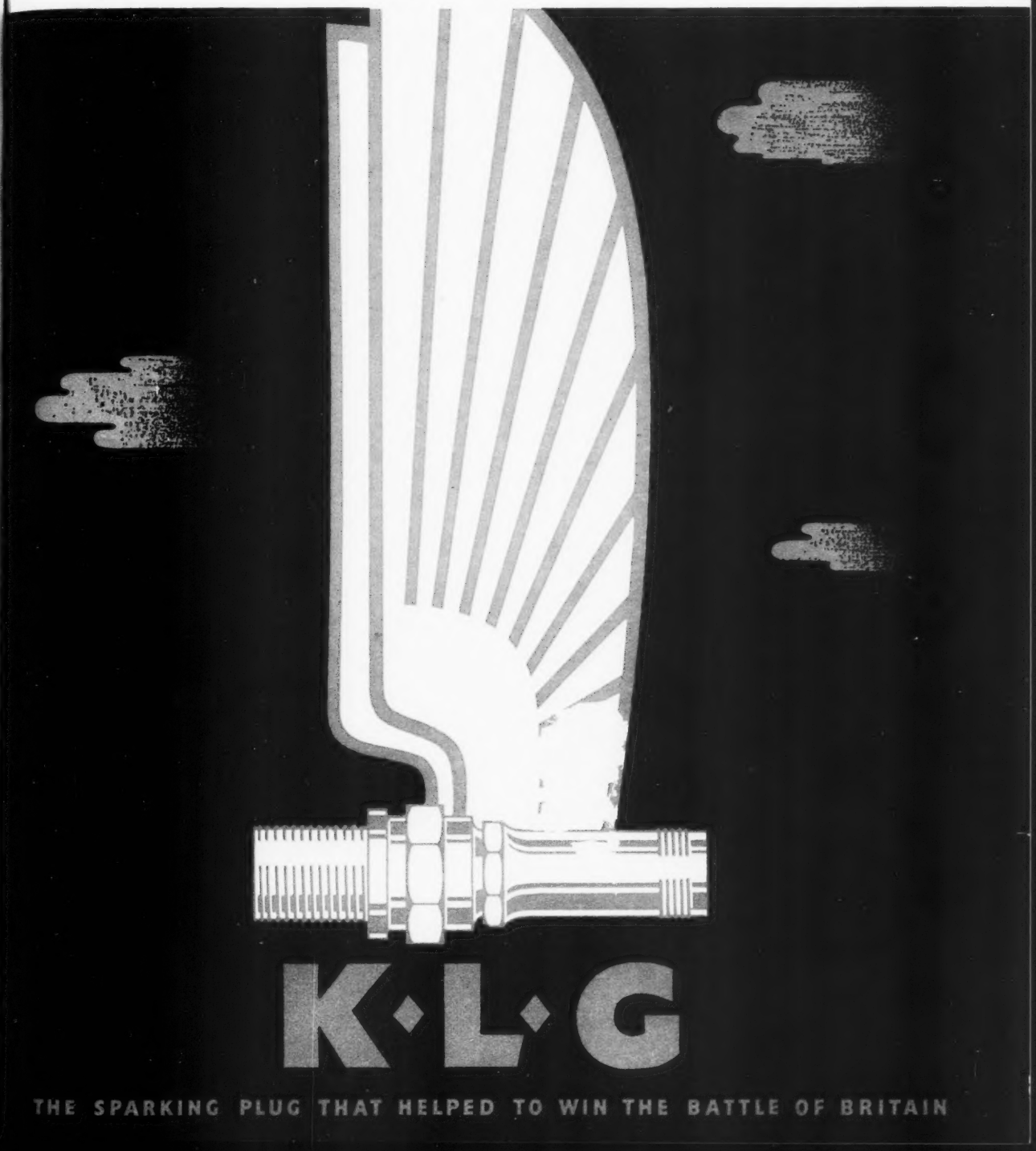

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FLIGHT
and
AIRCRAFT ENGINEER

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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The Outlook

The Future of Aircraft Manufacture

WITH the triumphant ending of the wars, the thoughts of mankind turn naturally and properly to the prospects of air transport and the benefits which it surely must confer on the world. One's mind turns away from the Lancaster and the Tempest, and tends to concentrate on the York, the Tudor, the Brabazon and the several others coming along. Will they all be ready in time and in sufficient numbers to give the British Empire its due place in the future flying world? Will British firms secure their due share of the traffic, or will the United States get in first and appropriate all the plums? These are the questions now exercising the mind of the aeronautical fraternity.

This concentration on peaceful commerce tends to obscure the fact that there will still have to be an Air Force, and that it will, for a long time to come, be the best customer of the aircraft manufacturers. The R.A.F. will certainly not remain as large as it is at present. There will be no need for that. Thousands of men will be demobilised and many squadrons will be disbanded. But we feel sure that neither the Government nor the country would tolerate such a wholesale reduction as occurred after the Armistice of 1918. Britain has had a severe lesson, and there is no doubt that she has digested it.

There will almost certainly be some reorganisation of the R.A.F. as a result of the lessons of the wars. What form it will take and what will be the resulting shape of things cannot yet be foretold; but for one thing we may prophesy that there will be a great expansion of Service transport aircraft. They will probably outnumber all the machines that civil air transport will need for many a long day yet. Almost certainly there will also be a notable expansion of the Fleet Air Arm. At the moment we have four large carriers in the Pacific, but that figure is not adequate for the Royal Navy. The carrier has proved itself a vital element of sea power, and as such Britain must give it full patronage. New aircraft types will doubtless be designed for work off the carriers. We look forward also to large orders for modern types of flying boats by Coastal Command. The Sunderland has carried on very bravely for six years, but it cannot last for ever, and something faster is needed.

The Ministry of Aircraft Production no longer stands on its own feet, and whether it will continue to exist for long is more than we can say. At least it is certain that for many years to come commercial flying will give less employment to manufacturers than will the two flying Services.

Occupation by Air

AS the first and last blows in the war between Japan and the Allies were struck from the air, so it is fitting that the first step in the occupation of the home islands of Japan should be made by airborne troops. American "doughboys" were instructed to land by glider and parachute on airfields near Tokyo, while the U.S. Pacific Fleet steamed into the bay and began to put ashore a million ground troops. Simultaneously the Russians have landed airborne troops at Port Arthur, and the Americans have assembled at Okinawa the greatest fleet of transport aircraft ever brought together. They are probably intended to set free shipping, which is needed to bring home the prisoners of war and internees from many parts of the temporary Japanese Empire.

This procedure is unusual, and naturally unprecedented. So is the nature of the Japanese surrender,

which has made these preliminary landings advisable. That the Japanese Government is sincere in its decision to surrender there is no doubt; but the fanaticism and treacherous instincts of the Japanese people, and of some military commanders, make it necessary for the occupying troops to run no risks. It had been expected that the authority of the Emperor would have secured implicit obedience and an immediate laying down of arms; but events cast some doubt on whether things would turn out exactly in that way.

There is no doubt that the Allies could forcibly occupy the Japanese islands even if a state of war still continued; but that would have meant fighting and the loss of some American lives. The presence of airborne troops in the rear of the coast defences was considered a sufficient guard against that danger. It is indeed a good thing that such a precaution could be taken in such incalculable circumstances.

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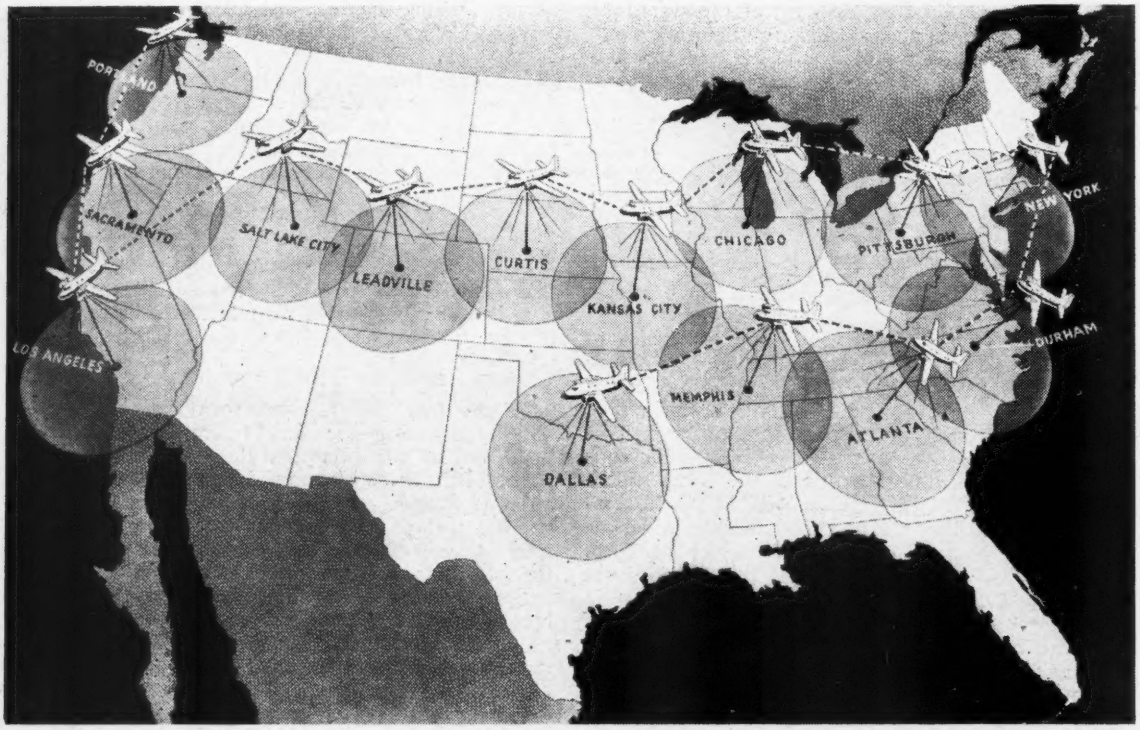
Towards the All-wing Ideal

A PARAGRAPH in this issue serves as a reminder of a type of aircraft of which a good deal was heard immediately before the outbreak of the war. It records the fact that a Burnelli "Flying Wing" is now ready for flying tests in Canada, where it has been built by the Canadian Car and Foundry concern. It may be recalled that as long ago as 1936 that firm secured sole Canadian rights in this unorthodox design, and that in the United Kingdom the rights are vested in Cunliffe Owen Aircraft, who built a machine just before the war powered by two Bristol Perseus engines.

Many have been attracted by the "all-wing" ideal, and certainly the fuselage of orthodox aircraft is a drag-producing member which houses the payload and carries the tail but contributes little lift in return. In the Burnelli design the fuselage is of aerofoil section, with a chord large enough to give full headroom at fairly normal thickness/chord ratios. The basic design is very old (it must be nearly 20 years since Mr. Vincent Burnelli first proposed it) but modern knowledge must be capable of improving it considerably. Even as long ago as 1936 the American National Advisory Committee for Aeronautics approved the claim that the aerofoil-section fuselage contributed 25 per cent. of the lift and the wings 75 per cent. That was with a slab-sided fuselage section. Fairings and other dodges might increase that proportion, in which case the Burnelli scheme might form a good solution of the problem. The pure all-wing ideal has many control and stability difficulties.



NEW USE FOR AIRCRAFT: The Westinghouse Electric Corporation and the Glenn Martin Company are jointly developing a scheme for using aircraft flying at great heights as carriers of television transmitters, thus covering a far larger area than is possible from a ground transmitter. Petrol is cheap in America!

R.A.A.F. official photograph.

Australian-built Bristol Beauforts did good work in tactical reconnaissance in New Guinea. Here is the squadron.

Tac. R. Beauforts

Royal Australian Air Force Enthusiastic About Their Bristols in the Aitape Campaign

By FRANK SMYTH*

AT the outset of the drive by Australian land troops against the beleaguered Japanese garrison of Wewak, the Prince Alexander and Torricelli mountain ranges, it was not easy to assess the enemy's strength and actual disposition of forces. We knew his strong points on the coast through aerial reconnaissance. But even there, at Wewak, it was something of a revelation, towards the end of the coastal campaign, to find 7,000 cremated Japanese bodies in caskets. They had been killed or died earlier in the war.

During the air attacks on this sector in 1943 and the beginning of 1944 our estimate of enemy casualties caused by air strikes have always been extremely conservative. Maybe some of those 7,000 had been reckoned among the living in our figures of the enemy's strength on the coast well on into 1945. Then back in the mountains it was even more difficult.

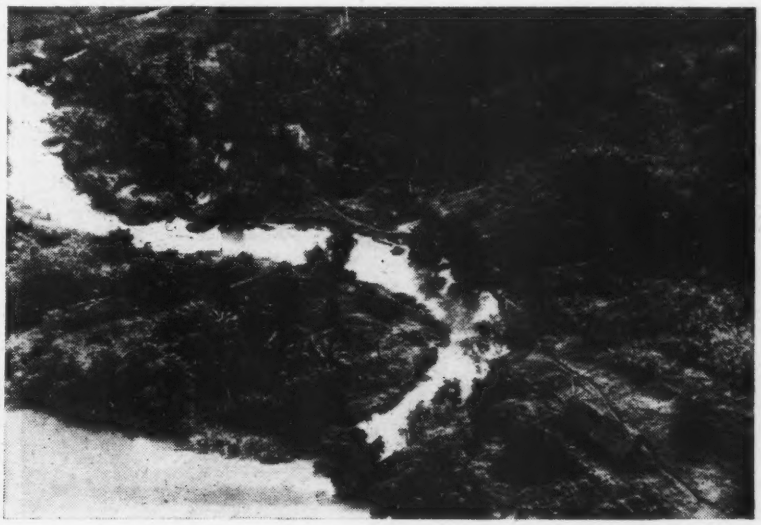
It may now be disclosed that at one period a special Army patrol went in search of intelligence behind the enemy's lines, down towards the Sepik. The R.A.A.F. provisioned this unit by air and dropped pigeons by parachute. That was one means of determining just what the enemy was doing in the mountain terrain. There were other means. But the bulk of our intelligence on enemy movements, defences, and the like came from aerial tactical reconnaissance flown by Australian crews in Australian-built Beaufort bombers.

This work was stepped-up during the campaign and reached its highest pitch just prior to the taking of Wewak, and it was round this time that the Army made an emphatic request to the R.A.A.F. that Tac. R. in this area should be put into the hands of detailed Beaufort crews, because information furnished by them to that date had proved most reliable and of immense value.

Army Admiration

A point of particular interest is that throughout the Aitape campaign the work of the Beauforts was held in particularly high regard by the Army. It was not long before requests generally specified that this be carried out

* The author is New Guinea correspondent to "Wings," the R.A.A.F. official journal.



R.A.A.F. official photograph.

One of the targets. Japanese headquarters on Sepik River, wiped out since this picture was taken.

TAC. R. BEAUFORTS

by the Beauforts. It was quite useless to talk to the Army about the "manufacturer's intentions" in building particular types of aircraft.

The Army's reply was brief: "We have found the Beaufort ideal" for so-and-so. The so-and-so, on one occasion, was registering artillery shoots. And so, during the Aitape campaign, the Australian light bomber became a spotter for naval shoots; air-co-ordinator for Army, Navy and Air Force actions; a lead-in for bomber support strikes; a scout for gun positions; a general intelligence gatherer; a photographic reconnoitrer besides a bomber and strafer. Everything, in fact, that could be expected of aircraft of several different makes.

Flight Lieutenant A. F. Tutt, of Hawthorn, Victoria, who was to become commander of the special Tac. R. Flight, was quite happy about the Army's request. Previously a fighter pilot, flying Kittyhawks, Airacobras, and sometimes Spitfires, the flight lieutenant had no lack of confidence in the Beaufort, and declared quite emphatically that it was the ideal for the work called for by the Army in the Aitape campaign.

"The Australian Beautort," said Flight Lieutenant Tutt, "is more manœuvrable than some fighters and, in spite of the fact that it is a twin-engined bomber, is an ideal Tac. R. machine." Maybe it is the way the flight lieutenant manages it, because another bomber pilot commented one day "to see Flight Lieutenant Tutt mark the target for a bomber strike is an education, not only in airmanship but in the ability of the Beaufort to do almost anything in the way of manœuvres."

As air co-ordinator for the landing at Dove Bay, Flight Lieutenant Tutt flew a Beaufort specially fitted up with two wireless "lines," one in contact with an R.A.A.F. officer aboard the Navy cruiser and the other in contact with the G.O.C. ground forces. Major J. Leitch, A.M.F. of Melbourne, flew with Flight Lieutenant Tutt to work at the end of the air-ground line, while the flight lieutenant co-ordinated Navy-Air actions, and as well photographed and marked targets for the bomber formations supporting the landing. Probably the success of the landing was to be found to a large extent in this single co-ordinating unit.

R.A.A.F. official photograph

Beaufort Squadron, Aitape. Aircrews and ground staff of the flight in front of their machines, about which they were very enthusiastic.

Captains of aircraft in Flight Lieutenant Tutt's special Tac. R. flight are Flight Lieutenant C. N. Hill, South Belmont, W.A., who previously flew Hudsons and Mitchells at Darwin and ferried Beaufighters to Morotsi and Liberators to other bases; Flight Lieutenant L. A. Plumridge, Bendigo, Vic., a flight commander for the Dove Bay landing; and Flying Officer Morley, of Mt. Lawley, W.A., who has been on Tac. R. for six months of the campaign. Each has logged more than 1,000 flying hours.

The Element of Surprise

In their stocktaking over the territory held by the Japanese in New Guinea, the Tac. R. Beauforts went in at amazingly low altitudes, as one pilot put it "skimming the tree-tops." To the Nips this produced an element of surprise with, at times, some rather amusing results (maybe not to the Japs).

For instance, Flying Officer Morley's navigator, Warrant Officer L. Orr, of W.A., is still keeping an eye open for that Nip who rushed madly out of his tent in his pyjamas and disappeared into the jungle. But as that occurred a few days before the taking of Wewak the yellow man is probably still running.

Tac. R. starts near dawn, and the Beaufort, sweeping in over the trees, at this hour often upset some hungry Jap's breakfast. The Japanese adopted all sorts of tricks to avoid observation. Down by the Sepik, navigator Warrant Officer Keith Ball, of Mosman, N.S.W., saw two palm trees walking along a village street. The walking palms proved to be camouflaged Jap soldiers. Some of the enemy's attempts at camouflage were clumsy, but others very clever. The idea of palm leaves on the march could hardly be classed in the latter category.

Navigator Flight Lieutenant J. R. Muller, whose training as a journalist helps him to register the unusual, had an eye for peculiarities on the earth's surface in the mountains. He was

R.A.A.F. official photograph

Members of the Beaufort Squadron. Lt. C. C. Eling briefing Tac. R. crews at Tadji Strip, Northern New Guinea

TAC. R. BEAUFORTS

probably the flight's expert foxhole detector, having found clusters of them round the ridges of the Yamil area, a sighting that has been very helpful to our drive in that sector. Of course, all the Tac. R. crews had picked up foxholes—hundreds of them.

There were several accountants in this flight. One was navigator Warrant Officer A. L. Preece, of Lakemba, N.S.W., who did good work in assessing damage done to Jap positions after bomber strikes. His best credit was Timbunke, a Japanese headquarters on the Sepik, which he photographed and on which his pilot, Flight Lieutenant Tutt, led a formation of Mitchells, Liberators and Lightnings. Timbunke became a dead loss to the Japs.

With these Tac. R. aircraft constantly over his domain the Jap's big problem was when to work and when to hide. Two Japs were caught recently shovelling dirt away from their underground homes south of Yamil. They saw the bomber in time to disappear into their foxholes "like rabbits into their burrows."

Another time Japs on the route dropped their packs and made for the jungle. Unable to find life round an enemy-occupied hut area, a Tac. R. aircraft tore up the washing on the line. This sort of thing, of course, compensated for work of a more laborious or monotonous nature. The Australian is naturally a sporting man. One wonders, though, whether the Japs would appreciate his sense of humour.

The enemy in the hills also got his daily news sheet, giving him an account, in his own language, of our progress against his Empire. Pilots paid tribute to their navigators who, they said, were the really hard-worked men of Tac. R. They had to see everything, take notes, and pin-point observations on maps.

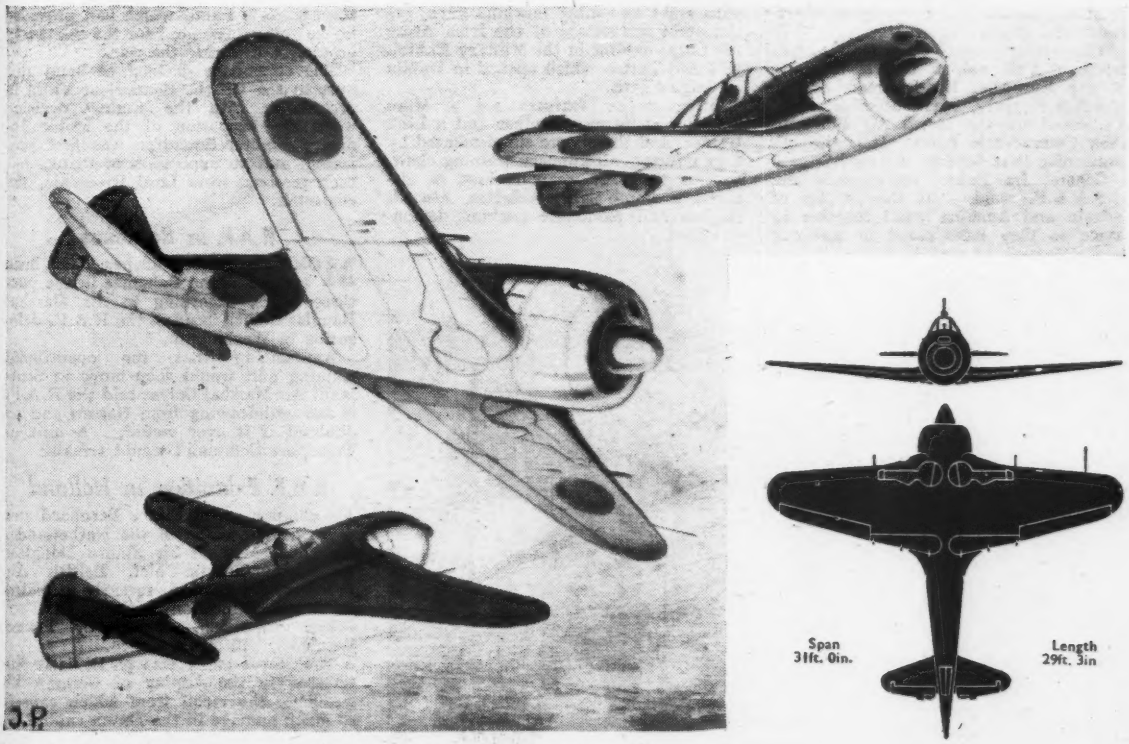
The wireless air gunners assisted as observers and photographers, and sprayed with their guns areas of Jap occupation as the Beaufort passed over. "That," said Flight Lieutenant Tutt, "made the Japs keep their heads down. They hadn't time to get any heavy stuff on to us, but they took a shot occasionally with small arms. On one day an aircraft was holed twice, but without any serious consequences."

The Personnel Concerned

Among the wireless air gunners was Flight Lieutenant Max Tomlinson, grazier of "Emu Hill," Inverell, N.S.W. "Emu Hill" has been in the Tomlinson family for just on a century. And there was Flying Officer C. G. Baynes, of Maryborough, Queensland, who was mentioned in despatches in 1942 on the sinking of a Japanese 8,000-ton merchant ship in Rabaul harbour in a Beaufort torpedo attack. The pilot, Flight Lieutenant Ralph Finlay, got the D.F.C. and other members of the crew were mentioned.

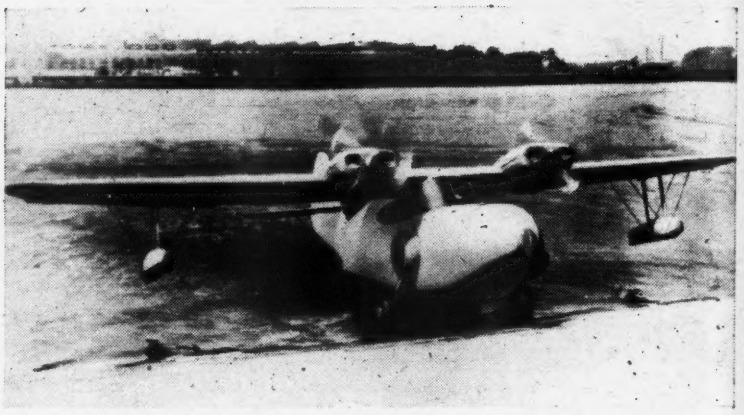
Other Tac. R. W.A.G.s were Warrant Officer D. L. Gill, Canberra, A.T.C.; R. C. Johnson, Inverell, N.S.W.; Flight Lieutenant J. H. Smith, Culcairn, N.S.W.; Warrant Officer A. J. Barr, Camberwell, Vic.; Flight Sergeant F. J. Lewis, Goodwood, S.A.; and Flight Sergeant D. B. Roberts, Kinross, via Lismore, N.S.W.

NAKAJIMA ARMY FIGHTER "TOJO"



Although Tojo was not encountered anything like as often as Zeke and Tony, it needed to be treated with due care in case it had a good pilot. Its all-round performance was good, top speed being 383 m.p.h. Tojo was fitted with a 1,450 h.p. Nakajima Type 2 radial engine and alternative armaments comprised two 7.7 mm. and two 12.7 mm. guns; four 12.7 mm.; or two 12.7 mm. and two 40 mm. With armour protection it weighed over 6,000 lb. all-up, and had a tactical range of just over 300 miles.

HERE AND THERE



COMMONWEALTH TRIMMER is the name of this attractive-looking three-seater amphibian. Cabin seating can be made up into two bunks and there is a built-in galley. Its horizontally opposed air-cooled engines (make unspecified) give a top speed of 132 m.p.h.

Research in Canada

A GLOSTER Meteor aircraft is to be sent to Canada from Great Britain to be used in R.C.A.F. research on jet-propelled aircraft.

A new research department has recently been established by the R.C.A.F. where work will be carried on with the design of new types of military aircraft in close co-operation with the Government-owned firm of Turbo Research, Ltd., at Toronto.

Comrades in Peace

AS a memorial to two and a half years during which the U.S.A.A.F. was at Bushey Park, a Portland stone pedestal surmounted by a bronze plaque on a 5-sided base with the American Star in white stone was unveiled at the headquarters of R.A.F. Transport Command, Bushy, near Teddington, last week, by Air Chief Marshal Sir Christopher Courtney. (See picture below.)

The inscription on the plaque reads, "This tablet marks the site of the European Headquarters of the U.S.A.A.F., July, 1942-December, 1944. Dedicated by the Royal Air Force to their Comrades in Arms. It is through Fraternity that Liberty is saved."

General Ira Eaker, representing the U.S.A.A.F., said, "If the peoples of Britain and America stand together in peace as they have stood in war our world will be safe and secure for the future. For our part, we of the American Air Forces intend to continue our close partnership with the R.A.F. to ensure that peace shall be kept."

Hurricanes in Eire

TWO Hurricanes, one a fighter-bomber equipped with four 20 mm. cannon and bomb gear, and the other a fighter with eight Browning machine guns, are the main attractions of the Irish Army Air Corps exhibit in the Military Exhibition and Tattoo which opened in Dublin on August 27th.

Other major features are a Miles Magister elementary trainer and a Link trainer, and these were supplemented by a gun turret, air-gunnery training chair, various types of weapons used in aircraft, a bomb-sight, dinghies, aircraft engines and parachute packing demonstrations.

Anti-aircraft weapons on show at the exhibition included 3.7in. and 3in. anti-aircraft guns and a 40 mm. Bofors gun.

Motor Industry Fighter Fund

MOTORISTS and members of the motor trade will be interested to learn that with the disbanding of the Motor Industry Fighter Squadron the organising secretary, Mr. H. G. Starley, had a balance left over of £48 17s. from the Comforts Fund, which had provided books and games, etc., for the pilots and ground staff during the war.

The committee decided to hand this over to the R.A.F. Benevolent Fund in accordance with the original decision when the formation of the Motor Industry Fighter Squadron was first projected, and an expression of thanks has been received from Lord Riverdale, the chairman.

R.A.F. in Bahamas

MORE than 5,000 airmen have been trained in the Bahamas in the past three years, according to Air Marshal Douglas Colyer, head of the R.A.F. delegation in Washington.

Announcing that the operational training unit would soon move to Scotland, Air Marshal Colyer said the R.A.F. is not withdrawing from Nassau and he doubted if it ever would. A unit of Transport Command would remain.

R.A.F. Exhibition in Holland

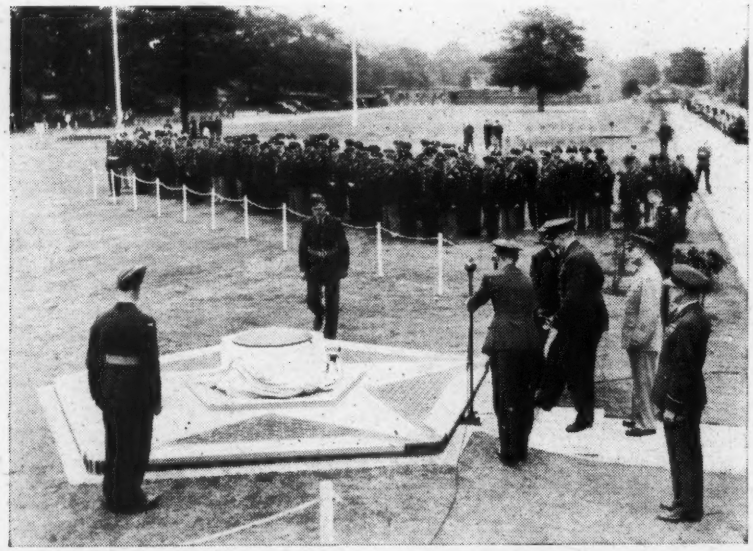
IN company with Prince Bernhard and Princess Juliana of the Netherlands, Air Chief Marshal Sir Sholto Douglas, Air Commander-in-Chief, British Air Forces of Occupation, recently attended an R.A.F. exhibition at the Hague.

The exhibition, opened by Prince Bernhard, will last a month.

The Royal party was particularly interested in the display of German V-weapons, the recoil from which caused so much damage in the Dutch capital.

West Country Show

SIR STAFFORD CRIPPS, President of the Board of Trade and formerly Minister of Aircraft Production, has been invited to open the Bristol Engineering Exhibition on Friday, Sept. 7th, in the Victoria Rooms, Bristol. The exhibition



FRATERNAL SYMBOL: Air Chief Marshal Sir Christopher Courtney and Lt. Gen. Ira C. Eaker (light uniform) at the unveiling ceremony at Bushey Park, European H.Q. of the U.S.A.A.F., referred to in an adjoining paragraph.

HERE AND THERE

which has been organised by the Bristol Engineering Manufacturers' Association, a local body of nearly 200 firms, is to remain open until Saturday, September 15th. The opening ceremony is timed for 2 p.m., but thereafter the exhibition will open daily at 10 a.m.

Lord Louis Hurries Back

ADMIRAL LORD LOUIS MOUNTBATTEN, Supreme Allied Commander of "Seac," who was in England when the first Jap offer of surrender was made, decided to return to the Far East immediately and was in his headquarters at Kandy, Ceylon, within 31 hours of leaving England.

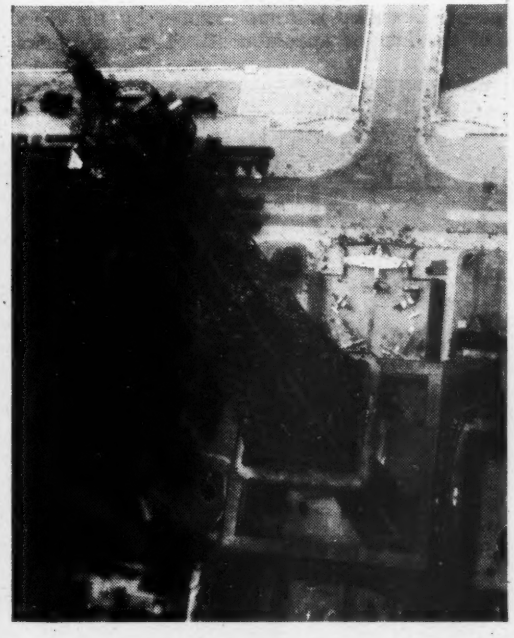
The Avro York in which he flew covered the 6,345 miles in a flying time of 28hr. 38min., an average speed of 222 m.p.h. The total time for the trip including stops *en route* was 30hr. 46min., giving an overall average of 206 m.p.h. The pilot was Sqn. Ldr. J. F. Matthews, A.F.C., of Iver Heath, Bucks.

Tedder Visits South Africa

AIR CHIEF MARSHAL SIR ARTHUR TEDDER, former Deputy Supreme Commander in the West, arrived at Bulawayo, Southern Rhodesia, last week to begin a month's visit to South Africa, during which he will advise the Government on the post-war composition of South Africa's Military and Air Forces.

He and Lady Tedder went to Pretoria on August 22nd where they were guests of Field Marshal Smuts and Mrs. Smuts at the Prime Minister's official residence, and the next day Air Chief Marshal Tedder attended a Victory Luncheon in Johannesburg.

DEMOBBED : Mustangs of the U.S.A.A.F. are being prepared for sea transit, taken by road to the docks and loaded on ships by the R.A.F. for their return to America—a bit of reverse lease-lend service. Here are 41 of them on the deck of a grain ship, the *Empire Macrea*, at Liverpool docks.



A glimpse from the air of the U.S.A.A.F. open-air exhibition recently opened in the shadow of the Eiffel Tower in Paris.

News in Brief

A SPECTACULAR air force demonstration which should have marked Soviet Air Day in Moscow on August 20th was cancelled on account of bad weather.

* * *

President Benes has decorated Air Marshal Sir Sholto Douglas, Air Officer Commanding British Occupational Air Forces in Germany, with the Czechoslovak Order of the White Lion.

* * *

R.A.F. Transport Command Dakotas recently brought to England 100 Dutch children, whose health has been impaired during the occupation. They were flown from the Hague to Croydon and are now enjoying a nine-week's recuperation holiday in Scotland.

* * *

Wing. Cdr. P. B. (Laddie) Lucas, D.S.O., D.F.C., sports writer and international golfer, is to marry Miss Jill Doreen Addison, daughter of Lt. Col. and Mrs. A. M. Addison, of Ascot. Miss Addison's sister, Thelma, is the wife of Grp. Capt. Douglas Bader.

* * *

The Glasgow branch of the Royal Aeronautical Society is to hold a "Films and Discussion" evening in the Royal Technical College, George Street, on Tuesday, September 20th, at 7.30 p.m.

Mr. Philip Baker has been appointed public relations officer to the British Export Trade Research Organisation and will operate at Georgian House, Bury Street, St. James's, S.W.1.

* * *

Dowty Equipment, Ltd., Cheltenham, has recently produced an attractive booklet for the guidance of newcomers to the firm. It is printed on high quality art paper, well illustrated, and pays special attention to the firm's very comprehensive welfare facilities.

* * *

The London office and showrooms of Taylor, Taylor and Hobson, Ltd., is to be transferred from its present Mill Hill address to 150, Holborn, E.C.1. The new premises are on the corner of Holborn and Gray's Inn Road.

* * *

The Canadian War Assets Corp., the Government agency for surplus disposal, has nearly 7,000 aircraft engines not eligible for the Department of Transport licences to sell to the highest bidders. Types include Gypsy, Cheetah, Jacobs, Menasco, Mercury, Pegasus, Perseus and Merlin, and most of them are in new or slightly used condition.

* * *

Just before the Japs surrendered, Canadair, Ltd., Montreal, a Government-owned factory making a Canadian version of the DC-4 for T.C.A. and export, is reported to have switched production to the military version, the C-54, for R.C.A.F. use in Pacific transport operations.

* * *

Messrs. W. L. Harris and T. Gillett, executive directors of Silentbloc, Ltd., and its subsidiary, the Andre Rubber Co., Ltd., accompanied by the latter concern's chief chemist, Dr. S. Buchan, have recently returned from an extensive tour of synthetic rubber plants and rubber factories in the U.S.A.

D

Admiral's barge, modern version. The Beechcraft Expediter which has been specially converted for the personal use of Vice-Admiral Sir Dennis Boyd.

Admiral's Expediter

Personal Aircraft for Fleet Air Arm Chief : Very High Quality of Finish

IT is most appropriate that the Admiral (Air) should have what is, in effect, an aerial version of an admiral's barge. The parallel is not quite exact because Vice-Admiral Sir Dennis Boyd will use his specially prepared Beechcraft Expediter for a very wide range of duties, and the uses to which an admiral's barge may be put are fairly proscribed, to say the least.

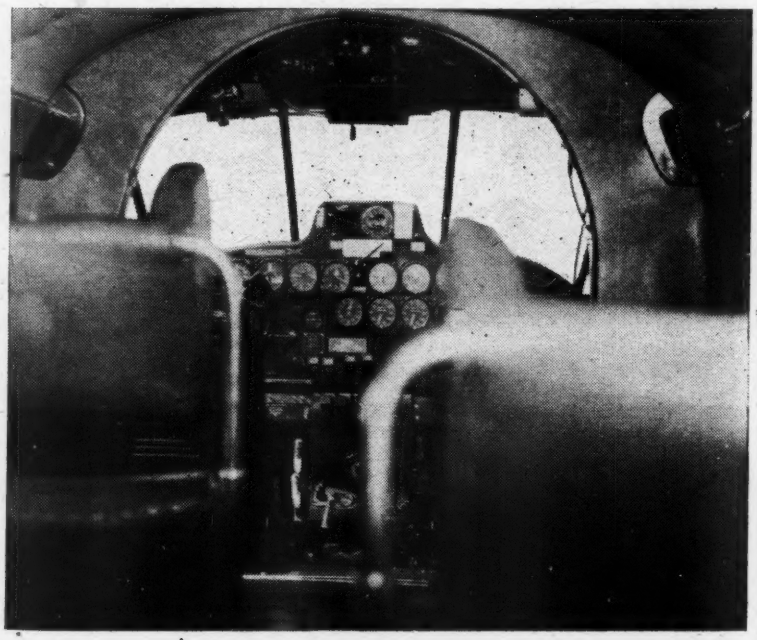
When considering Admiral Boyd's choice of aircraft it is worthy of note that there are only about ten Expediters in the country in British hands (the Americans have a good number over here), and all are in the possession of the Navy. Again, there is no British aircraft in quite the same class, which, one must reflect, is a great pity. One naturally feels that an Admiral of the Royal Navy should use a British aircraft, but there is a very good case for the Expediter. It should be remembered that the Fleet Air Arm is equipped with a goodly number of American aircraft; that, as mentioned, the Expediter is a worthy machine for the job; and, additionally, the Navy has them on its hands. And lastly, that the use of an American aircraft by an Admiral of the Royal Navy could have only a beneficial effect on Anglo-American relationship.

Colour Scheme

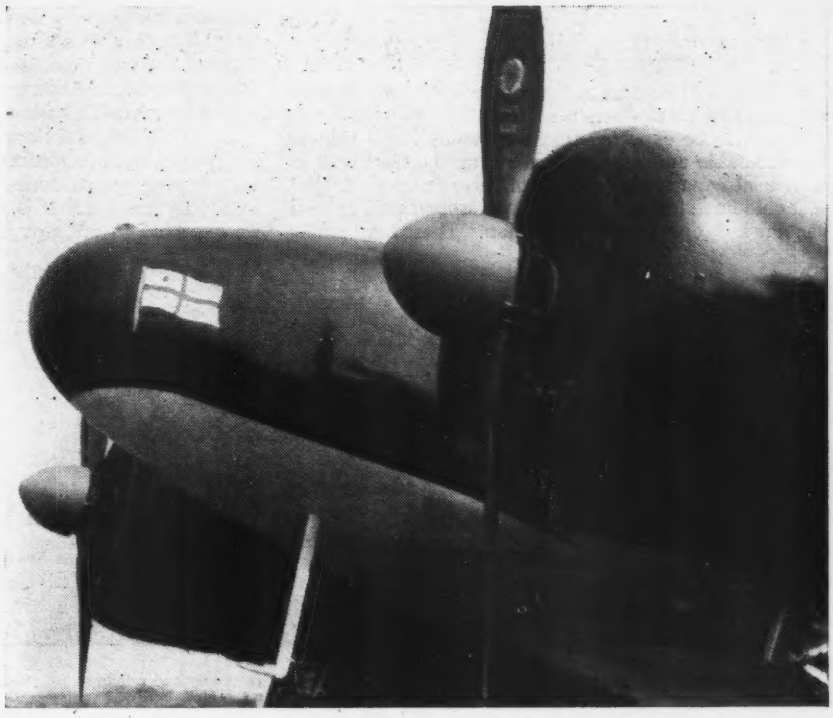
The Expediter which has been prepared for Admiral Boyd is a standard machine in which the cabin has been refurnished and the exterior repainted. Apart from these alterations, the only modification is to the radio equipment.

Externally the machine is good to look at; a special high-gloss cellulose in admiral's blue and pale duck-egg blue imparts a gleaming finish to the upper and lower surfaces respectively, whilst the Service roundels on wings and fuselage are of smaller diameter than usual. On each bow, or side of the nose, is emblazoned in enamel the flag of a vice-admiral, and the words "Royal Navy," together with the aircraft's number on each side of the fuselage roundels are carried out in gold leaf.

In effect, apart from the undersurfaces, the aircraft is finished in the colours of the Brigade of Guards, for the dark-blue exterior is complemented by the deep scarlet of the interior appointment. The four chairs



Certain changes have been made in the standard cockpit layout owing to modifications to the radio equipment.



On each side of the nose of the Expediter is a Vice-Admiral's flag. The machine is finished in two shades of blue.

which are staggered fore-and-aft, two per side, were specially modified by Rumbolds from the standard V.I.P. type chair to bring the overall width down to 23in. They are upholstered in dark red hide and have adjustable back-rests and adjustable winged head rests.

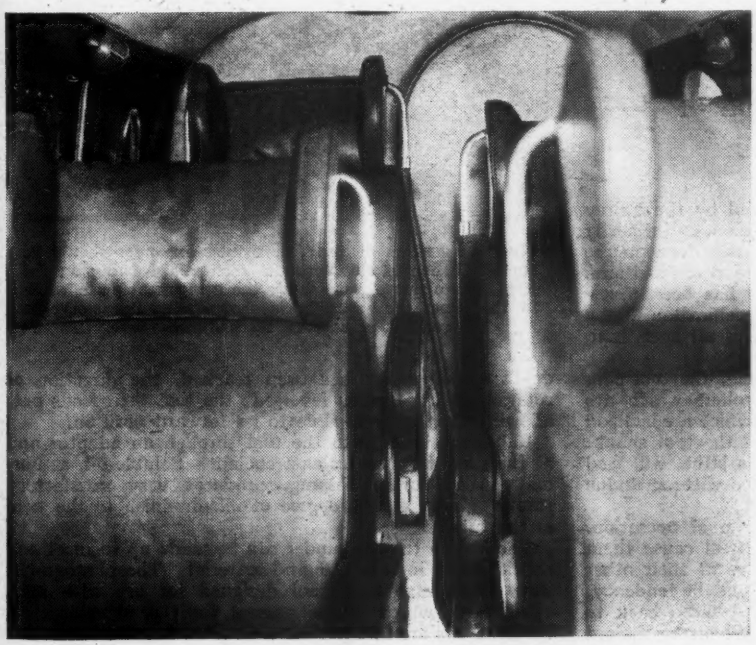
Cabin walls are sound-proofed with Sepak padding and covered with real hide, of similar colour to the chairs, up to the top line of the windows. Mahogany vertical covering strips break the wall length into three panels, and the cabin roof is ceiled with a beige-fawn woollen fabric trimmed with scarlet leather piping. A fawn short-pile carpet, also trimmed with scarlet leather, covers the floor.

On the port wall in front of the rearmost chair—which is the Admiral's favourite seat position—is a mahogany folding writing table and, as noise is not conducive to work, sound insulation, or absorption, has received some attention. Sepak is used to line the roof as well as the walls, and each of the cabin windows, including the circular port in the door and that opposite, is glazed with two thicknesses of Perspex enclosing an air space. It is to be expected, however, that these measures will to some extent be negatived by the fact that the control cabin opens direct to the main cabin, there being no door fitted between them. Consequently, should any window in the cockpit be open, airscrew and engine noise will be transmitted to the cabin without let or hindrance.

Cockpit Layout

Ventilation is effected by an extractor duct (aerodynamic) in the centre of the roof, whilst ducts above the windows feed adjustable, individual punka louvres at each seat for cool-air supply. Warm air is derived through engine exhaust heat exchangers and is fed to ducts at floor-skirting level in the walls, whence it emerges through gauze-covered vents; control of warm-air feed is by the pilot.

The cockpit layout and general arrangement is neat and clean, all controls being well placed and coming nicely to hand. An automatic pilot is fitted and, as the panel is set directly facing the captain's seat, the normal flying instruments are displaced above and to the right of it. This is not too bad, but as the engine instruments are all grouped to the right of the fascia, a certain amount of parallax must necessarily obtrude in their case. The second pilot's seat is occupied by the radio operator, and most of his controls are located in the roof with remote transmission linkage to the actual sets, which are stowed aft of the main cabin. In addition to two 2-band



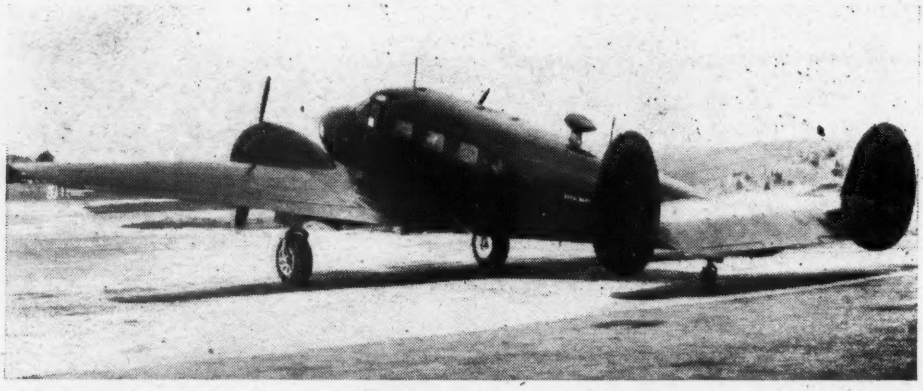
The four chairs, staggered fore-and-aft, were modified from the standard V.I.P. type by Rumbold to reduce the width to 23in.

ADMIRAL'S EXPEDITER

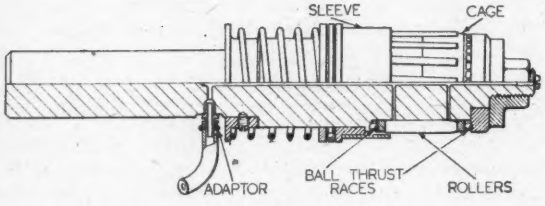
W/T sets, V.H.F. and radio compass equipment with blind approach amplifiers are fitted.

As it is to be expected that Sir Dennis Boyd will do a considerable amount of travelling on the Continent in his official capacity it is, we feel, essentially right that he should have for the purpose a well-appointed personal machine in keeping with his position. These finer points may not matter very much to the Englishman in wartime, but they would have their effect on most Continentals at any time, and from this aspect it is to be hoped that Service officers of Flag, Field and Air Rank may one day each have their personal aircraft.

All in all, Admiral Boyd's Expediter must be summed up as an extremely pleasant aircraft, very well contrived for carrying out its duties in an efficient and essentially satisfying manner. It is, in fact, what might rightfully be expected in an aircraft of its calling.



When this picture was taken the sub-standard size R.A.F. roundels had not been painted on. The words " Royal Navy " in small letters appear on each side of the fuselage.



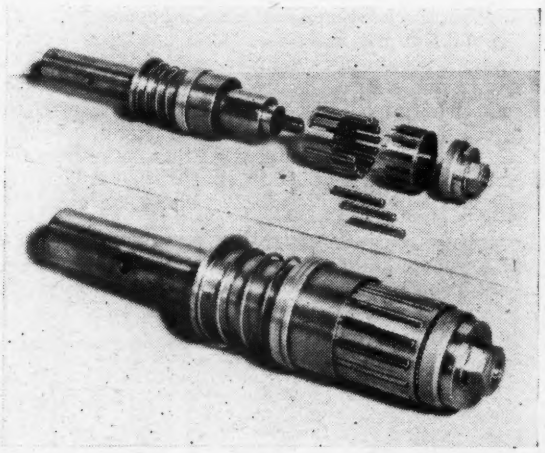
Expansion

A Neat Tool for Truing-up the Bore of a Tube

THE tube expander, newly developed by the Fairey Aviation Company's research division, is primarily designed to true-up the bore of a tube to a precise dimension, so as to accommodate a plug-end of fixed size. Hitherto, individual fitting of plug-ends has been necessary because of tube variations within specification limits. The new Fairey tube expander eliminates all such individual fitting work.

As shown in the accompanying drawing, the tool consists essentially of a cage of parallel rollers which are tapered slightly at their leading ends and which are inclined laterally at a few degrees to the axis of the tool shank. This is to ensure that the tool, when in a lathe, will feed itself in and out of the tube to be expanded without undue strain on the lead-screw of the lathe.

Ball thrust races further ensure freedom of operation. As the rollers enter the tube, the taper will cause them to tend to tip. As this occurs, the sleeve at their other extremity comes into operation to counteract the tendency. The sleeve is spring-loaded forwards, and slides back to allow the tool to enter the tube fully. When the desired depth of expansion has been reached, the direction of rotation of the tube is reversed; the tool then feeds out, allowing the sleeve to slide to its forward position.



These two views of the Fairey tube expander should be studied in conjunction with the sectioned drawing on the left. The upper picture shows the component parts, while in the lower the expander is shown with the sleeve in position for entering the tool in the tube.

Lubricant is fed into the tool through an adaptor and at the same time serves as a coolant. Soluble oil, as normally used for machining, produces very satisfactory results, giving a high degree of mirror finish to the bore of the tube.

The Fairey tube expander can be made up to meet any requirements in tube size and material. The photographs show a representative tool designed for use with 14G. 2½in. T.50, which is the present limit of development. Experiments are in hand for expanding heavier tubes.

Fate of Fokker Factory

How the Germans Were Outwitted During the War : Original Works Ready to Resume in About Three Months

BRITISH aviation circles will certainly be interested in learning something of what happened to the Netherlands aircraft works during the German occupation of Holland. Here is an account of how the Fokker works fared, given to a special "Flight" correspondent by Mijnheer Beelen, one of the Fokker directors.

IN July, 1940, the former proxy and head of the export department, Mr. F. W. Seekatz, was appointed managing director. The former sub-manager, Mr. J. E. van Tijen, remained in office until November, 1940, when he was arrested on a charge of having favoured the "enemy." Until the end of February, 1941, Mr. van Tijen was jailed in the Oranje Hotel at Scheveningen and was then released for lack of evidence. After having resigned his office with our firm, Mr. van Tijen was appointed head of the Reconstruction Institution at Middelburg.

In March, 1943, Mr. van Tijen was again under arrest. Via several concentration camps he finally landed in Buchenwalde, where he was liberated by the Americans. After his return to Holland Mr. van Tijen was appointed director of our firm by the Commission for Restoration of Justice.

In June, 1941, the *Reichsluftfahrtministerium* (German Air Ministry) appointed the German Dr. Ing E. W. Pleines technical manager of our firm as assistant to Mr. Seekatz. Dr. Peines tried by all possible means to raise the production, among other ways by employing German friends, appointing renegade Dutch hands, etc. Thanks to the fine behaviour of the loyal Netherlanders, who also knew how to stir up jealousy among the oppressors, this "production speed-up" was a failure.

Ca Canny Methods

Whilst in November, 1940, the production of the Fokker concern was estimated at 40 per cent. of the pre-war production, this figure still dropped considerably, in spite of the fact that the total personnel of 1,700 in May, 1940, was increased to over 5,000.

Apart from the Bücker trainer, no complete machines were constructed by us in wartime, although we were forced to finish the T8Ws in course of construction and destined for the Dutch Navy in the Netherlands and the Dutch Indies. Besides assembly work on the Dornier Do 24 and the Arado Sea Scout, mostly component parts of aircraft were ordered, such as tail fins, motor installations, floats, etc.

By cancelling several orders, even those the execution of which was in an advanced stage, the Germans themselves encouraged sabotage. The passive sabotage of our personnel could not be prevented, not even by an army of *Werkschütze* (factory guards), so that, as already stated, the production figures could not be raised.

In our works the drawing offices had a place quite of their own. They were not, as before the war, an integral unit that had to cater for constructional drawings on behalf of our factory, but worked chiefly for the German mandataries: Junkers and Messerschmitt. It was principally the old staff of technicians who remained employed here and maintained the relationship. Except for the representatives of the mandataries no Germans were employed by the constructional studios, whilst the number of renegade Netherlanders was exceedingly small.

During the years of occupation the connections with the Netherlands aeronautical services could be maintained, and building-up the future was one of the chief preoccupations.

The long-range machine that already existed as a project before the war was further developed, and also a few new passenger and freighter aircraft were designed. The number of engineers working at research work was extended beyond measure; we also succeeded in passing more or less camouflaged orders for wind-tunnel research work to the National Aeronautical Laboratory.

Until "Mad Tuesday" in September, 1944, we were full of hope for the future; the morale of the old and trusted personnel was excellent, and we all expected a speedy withdrawal of the Germans. This would enable us to save a large part of the first-class factory equipment and of the large warehouse stocks. On "Mad Tuesday," when the whole German occupation vanished precipitately, taking with them the collaborator N.S.B. (Dutch National Socialist Movement)' our wishes seemed to be fulfilled. Uufortunately, after a few days the undesired elements reappeared with instructions from Berlin to convey machines, stock, etc., to Germany. Until a very short time before the liberation, the occupier and his collaborators availed themselves of the opportunity to take away as much as they could.

Post-war Plans

Immediately after the liberation, plans were devised for starting the factories within the shortest possible time. The original factory sites can be put in order again for continuing manufacture within a period of about three months. Investigations have been made for finding the hiding places of stolen Fokker property in Holland and Germany. If the bringing-back of the property in Germany is not possible within a short time, we hope to receive permission to requisition the necessary machines from a German aircraft factory. We trust the Netherlands Government will give their support for the reconstruction and the continuation of our aircraft industry. Plans have already been worked out for the temporary employment of the personnel for repair work, preferably on aircraft, but possibly also for the construction, under licence, of foreign machines.

The technical staff of the Fokker concern has remained intact, and with the indispensable support of the Government they hope to be in a position to resume work very soon. So it will be possible in the near future to show that Holland knows how to maintain its fame, also in the matter of constructing national aircraft.

HAWKER-SIDDELEY BUYS CANADIAN FACTORY

SALE of the giant government-owned Victory Aircraft plant at Malton, Ontario, to the Hawker-Siddeley Aircraft Company was announced recently by the Hon. C. D. Howe, Canadian Minister of Munitions and Supply. No price was mentioned in the announcement and the sale is subject to satisfaction of certain conditions. The plant manufactured Lancaster bombers for the air offensive against Germany, and not long ago entered on a contract to produce the Lincoln for the war against Japan.

"One of the conditions of the purchase by the English company," said Mr. Howe's statement, "covers the establishment in Canada of a design, research and development organisation to promote the basic design and manufacture in Canada of all kinds of commercial and military aircraft, turbines for aircraft and other purposes and various auxiliary equipment in which the company specialises."

The sale followed a visit to Canada by Sir Roy H. Dobson, a director of Hawker-Siddeley and also managing director of A. V. Roe and Company, Ltd. The Malton plant of Victory Aircraft Co., Ltd., was established in 1938 by the National Steel Car Corporation.

R.A.A.F. Air/Sea Rescue

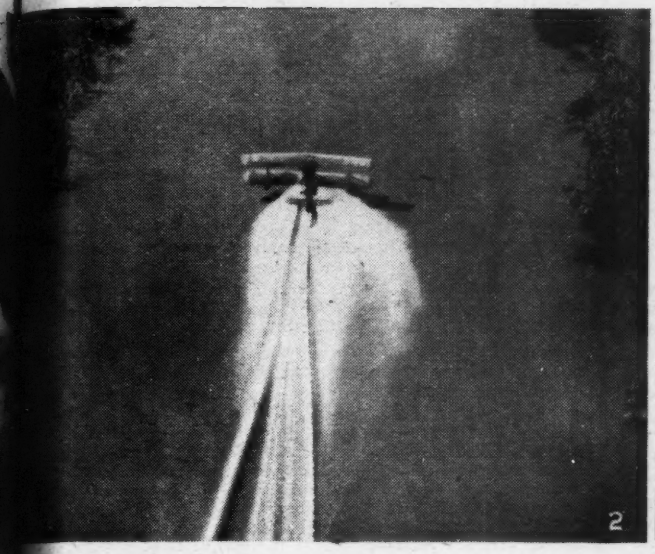
How an American Pilot was Picked Up from Under the Noses of the Japs by a Walrus of the Royal Australian Air Force

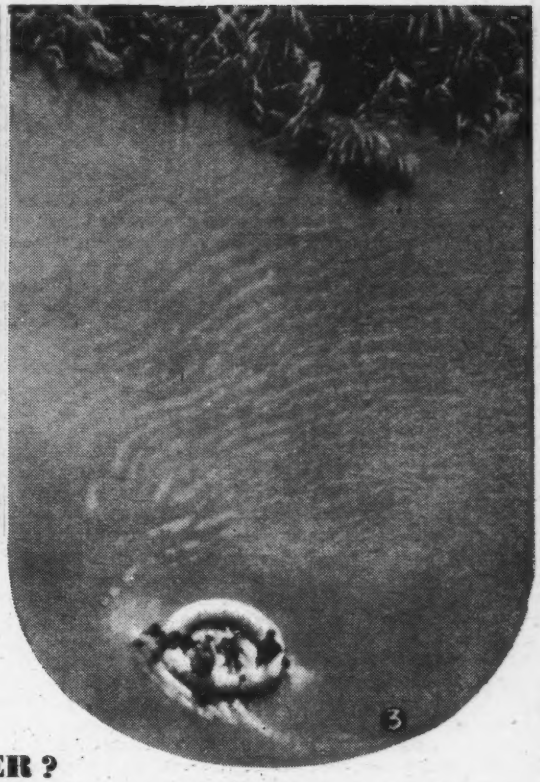
MANY lives have been saved in the European war by the Air/Sea Rescue Service. In the Pacific, too, good work has been done, and one of the most audacious rescues ever carried out by the Royal Australian Air Force is depicted in this series of R.A.A.F. Official Photographs.

Lieut. J. P. Carter, a Texas member of the U.S.A.A.F., was forced to bale out of his Lightning owing to engine trouble. He was over enemy-occupied territory and landed within ten miles of the Japs near Wewak. The only place on which a rescue aircraft could land was on the Kerawari River, some 250 yards from where he landed by parachute. Bad weather prevented his rescue until the fourth day. In the meantime he lived on a block of chocolate and a pint of water. Eventually a plodding Walrus alighted on the river, bringing two native boys, who paddled ashore in a rubber dinghy and hacked their way to Lieut. Carter

The pictures which tell this story were taken by a cameraman of the Royal Australian Air Force from an aircraft which protected the Walrus during the rescue.

4, At last the natives brought Lt. Carter back to the Walrus, whose pilot, F/O. Neil Agnew, took off over the tree tops to where Catalinas and Beauforts waited to lead the party back to base; 5, Lt. Carter with his rescuer, F/O. Agnew; 6, the party concerned: From left to right, Lt. Johnstone, the Angau representative who directed the operation, Lt. Carter, the two native boys, and F/O. Agnew.





1, Lt. Carter standing by his parachute, spread on the ground as a guide ; 2, the Walrus alights on the swift-running waters of the Kerawari River ; 3, the two native boys paddle to the shore. So thick was the kunai grass that it took them an hour to hack their way with machetes to Lt. Carter, 250 yards away.

WORLD'S LARGEST HELICOPTER ?

The PV-3 designed by Frank Piasecki of the P-V Engineering Forum of Pennsylvania is an eight-ten seater. The use of oppositely rotating rotors at the ends of the fuselage is a novel feature. Elevator control is by varying the lift of one rotor, and presumably rudder control is obtained by tilting the head of the aft rotor.

Is This What They Want?

Experimental American Design for the Owner-Pilot : Twin-Boom Pusher With Tricycle Undercarriage

THE shape of things to come in post-war light aircraft, with particular reference to the requirements of the private pilot, has been a subject of considerable interest for some time. "Indicator" has had some searching observations to make, and there have also been contributions by other writers to the pages of *Flight* on this absorbing topic. And the outstanding fact which has so far emerged is the absence of any real unanimity on what the small civil job should be like and what it should provide.

There is, for example, a sharp difference of opinion on the best kind of cockpit layout from the viewpoint of promoting safe flying. "Indicator," the reader may remember, viewed with a certain amount of disfavour any attempt to make the "office" of a light plane resemble the driving compartment of a motor car. Without reprinting his argument, it was roughly to the effect that if the amateur pilot (who may not be too experienced) is surrounded by ash-trays and flower vases, he may, one day, momentarily forget he is not driving his 2-litre Blizzard saloon and try to do something which no self-respecting three-dimensional craft would tolerate, the result probably being another job for the coroner. Opponents of this view hold that if you make the novice pilot nice and comfortable and put him in familiar and safe-looking surroundings, his mind will be at ease, his confidence in his aircraft enhanced, and his safety thereby increased; after all, the man who could "forget" he was flying would be virtually certifiable, and no mechanical contrivance can be made safe in the hands of a lunatic—with the possible exception of the Link trainer!

There are a score of other points over which opinions differ, but it is safe to say that all discussions on the ideal light aircraft quite rightly put safety as the first characteristic to be sought, though patently it is impossible to ensure 100 per cent. safety in any vehicle that moves—even the pedal-cycle has its potential perils, yet millions of small children ride them every day. All that can be expected in a private-owner's light aircraft, surely, is that, like any other kind of vehicle, it shall be reasonably safe in the hands of a reasonable person.

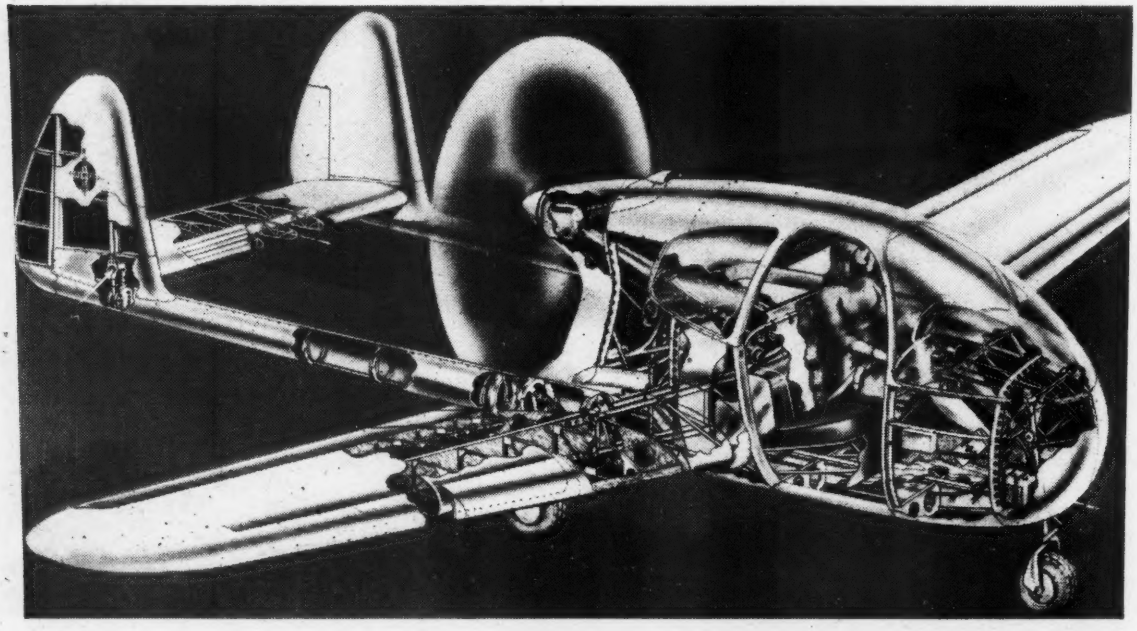
Britons Are So Bashful

It may well be that a number of British firms already have designs well advanced for post-war light aircraft intended to appeal to the owner-pilot (and club flyer, too) and that some of these differ greatly from the normal pre-war type and do provide a far greater measure of safety, comfort, economy and all the rest of it. But we have become so security-minded during the past six years—especially if we have been engaged on producing ever-better and better engines of war—that it has become a habit to regard *anything* new as a dark and deadly secret, especially if it flies!

In America, however, aircraft firms do not seem in the least bashful about disclosing particulars of new types of light aircraft even when they are still experimental. In America, too, the interest in the post-war light aircraft, or "personal plane" as they so aptly term it, seems to be even greater than it is in Britain, and a number of U.S. firms have, during the past few months, announced their post-war programmes and released a fair amount of information on new models.

One of the most interesting of the newcomers is an experimental Piper design in which safety has been given a "high priority," and we are indebted to *Air Trails* for the two illustrations accompanying this article.

Now although some of those who write articles, or "letters to the Editor," setting forth what they want, demand novel features quite incompatible with the performance requested at the price stipulated, designers are not so foolish as to ignore



NOT A PIPE(R) DREAM : This cut-away sketch by Budd Stone, which appeared in *Air Trails*, shows the interesting design features of the Piper Skycoupe to advantage. The girl pilot gives a size comparison and suggests easy handling. The ease of access provided by the large car-type door and low tricycle undercarriage, also the excellent visibility, will be obvious.

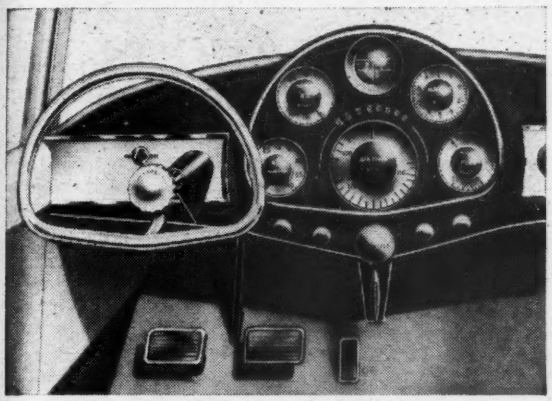
IS THIS WHAT THEY WANT?

entirely the expressed wishes of potential customers. But they know from experience just how far they can go, at the present stage of aeronautical development, if the result is to be popular with their sales department. It has to be remembered, too, that the more unorthodox the design, the longer it may take to "work out the bugs" so that it can be placed in the hands of the customer with confidence on both sides of the counter. And with all available design and engineering talent serving the war effort until now, there has not been much chance to get to work seriously on peacetime projects.

Nevertheless, the Piper concern has evidently managed to do quite a bit in this field, for their experimental "Skycoupe" has already flown in prototype and is now undergoing its development tests.

As will be seen from the first glance at the cutaway drawing by Budd Stone, the Piper Skycoupe is a twin-boom low-wing pusher type fitted with a four-cylinder horizontally-opposed air-cooled engine housed behind the pilot and passenger and contained within the fuselage. This is a complete breakaway from pre-war Piper standards and so is the constructional method adopted.

It will be seen that although the engine has been mounted low enough in the fuselage to keep the c.g. in a reasonable position, it is set at an inclined angle and drives a high-positioned propeller through a shaft and gear box, thus making



A horizontal control column and neatly arranged instrument panel are attractive cabin features. The starter button is on the extreme left behind the wheel and the smaller pedal to right of rudder controls is the brake. Dial needles all advance clockwise.

possible a very short tricycle undercarriage, the main wheels of which are retractable. This layout introduces a commendable safety feature on the ground (the right place to start pursuing safety), for not only does it make it next to impossible for anyone to walk into the airscrew, tucked away between the protecting booms as it is, but it gives the pilot a field of visibility when taxying, which is even better than that provided in the average motor car. Moreover, the low tricycle undercarriage and a wide car-type door on each side and in front of both wings and airscrew make it beautifully easy to get in and out of the little side-by-side two-seater cabin. Women pilots and passengers should particularly appreciate this feature, though airfield personnel may secretly regret the loss of entertainment provided with earlier types by the combination of a loftier cockpit, a playful slipstream, and feminine skirts. Safety and convenience in taxying are also enhanced by the steerable nose-wheel (non-retractable) which the sketch shows to be linked to the wheel instead of the rudder pedals. There are two advantages in this; the aircraft is steered like a car when being handled on the ground, and, more important still, the rudder can be freely used to correct a dropping wing when landing while the nose-wheel is held straight in readiness for the touch-down. In fact, the safety aspect here goes even further, since the knowledge that turning the control wheel would also turn the nose-wheel out of line just when contact with the ground was imminent should discourage the novice pilot from any foolish attempt to lift a dropping wing with an already stalled aileron.

Turning now to safety in the air, the Piper Skycoupe aims at non-spin characteristics as a built-in feature by the provision of fixed slots in the leading edge of the wings; these extend for almost the entire span in the experimental prototype, but the test flights may result in their being considerably modified or even eliminated altogether from future models. The reason for this is that, with the high-lift type of aerofoil used, it may be found that the built-in slots give so little additional advantage that their extra weight, drag and cost are not justified. That, however, remains to be discovered.

The good visibility already mentioned as a safety factor in taxying is, of course, an even greater boon in the air. The side windows extend a fair way into the curved roof, leaving only a very narrow "blind spot" immediately above and behind; at least three-quarters of the surrounding atmosphere is reassuringly exposed to the pilot's gaze. Incidentally, none of the windows open on the prototype; passengers being what they sometimes are, the risk of a thoughtless companion tossing some unwanted object out into the airscrew's path has thus been anticipated. But later production models may provide a small "no-draught" type of window with a removable screen on the pilot's side. This would permit him to stick his head outside if some emergency condition demanded it, and in any case the pilot (even an amateur, "Indicator"!) could surely be trusted to remember he had a "fan" spinning round just behind him.

Another safety feature, though less obvious, is the placing of the instrument panel well forward so that, in the event of a crash-landing, the occupants will be less likely to collide forcibly with it. The neatness of the instrument panel and the controls will be appreciated from the accompanying photograph, while an excellent little feature is that all the needles on the large, easily read dials move clockwise, thus preventing any possible confusion. Added to this mental comfort in the cabin's equipment is the physical ease of a 46in. cabin width with ample leg room for six-footers, and sponge rubber seat cushioning.

Spot-Welded Skin

Constructionally, the Skycoupe has a metal chassis-type fuselage, the main component of which is an "A" frame of I-section beams. The aluminium skin of the body is spot-welded to angle stringers of the same alloy; the two-spar steel tube centre-section is bolted to the "A" frame, and carries the welded steel tubular and channel frame on which the engine is mounted. The booms are built up of two overlapping halves and are anchored to the front and rear spars of the centre-section. The spacing of the nuts securing the two halves of the booms increases in stages from 2in. at the front end to 6in. at the tail, which is also a metal structure. An unusual feature in the tail unit is that a "stabilivator" (their lovely word for this one-piece movable aerofoil) takes the place of the conventional tailplane and elevators, and except for a sheet aluminium leading edge is fabric covered like the rudders. The fins have an aluminium skin.

Outer panels of the cantilever wing are built up with two wooden spars and spruce truss-type ribs. A light gauge aluminium alloy skin takes the drag loads; the ailerons and flaps are fabric covered, except that the latter have aluminium leading and trailing edges.

Finally a word about the power plant. This is a flat-four Franklin 4ACG-119 rated at 113 h.p. at 3,500 r.p.m. at sea-level. A stiff, well-braced, large-diameter tapered housing encloses the shaft drive to the gear box, which has a 0.7 to 1 ratio. This gear box is air-cooled from a small duct just in front of the airscrew on top of the cowling. The engine is air-cooled from ducts in the leading-edge roots, the flow of air being led past the cylinders and an oil radiator and out behind the centre-section. As the engine's exhaust is carried into the same outlet, a fair degree of suction is set up here, which assists the flow of cooling air past the cylinders. An electric starter is operated from the dash.

No performance data are available at present as tests, which may call for modifications, are not yet completed.

It seems that among the inevitable crop of "headaches" encountered during the evolution of this very interesting (not to say encouraging) design, three of the worst were: contriving a satisfactory method of attaching the booms to the centre-section spars having due regard for weight and cost, linking the rudder and "stabilivator" controls in the cabin with the tail surfaces without unwelcome complication, and adequately cooling the engine.

Problems one and two were, in fact, closely related to each other, because the method adopted to secure the booms to the centre-section spars had to leave adequate room for the control lines to pass through on their way aft. However, these and other little snags were finally overcome by the application of American ingenuity and, who knows, a few ice-packs.

Air-Atlantic

Recollections of a Pioneer Flight Made Eight Years Ago : Duration 20 Hours, Range 2,854 Miles

By E. T. HOUSE

TRANSATLANTIC flights are now commonplace, and long-distance air services of the future are planned on a grand scale. A pioneering event which was the forerunner of this activity, took place over eight years ago on the night of July 5th, 1937. On that night the first organised commercial transatlantic flight was made.

An Imperial Airways "Empire" flying boat *Caledonia* (made by Short Bros.) was the chief performer in this episode.* For the previous six months a series of test flights had been taking place around the base at Southampton, culminating in a direct flight to Alexandria; a full-dress rehearsal over a longer course, but with less difficult weather conditions and a miscellany of emergency alighting areas.

Final decisions as to the composition of the crew were made, together with tests of fuel consumptions, economic cruising and radio. Meanwhile, there were comprehensive investigations of all the difficulties, operational and technical, which might occur on a two thousand mile flight from Ireland to Newfoundland.

Then on the morning of July 2nd, after brief good wishes had been passed to the crew by the ground staff, the *Caledonia* broke away from the restraining waters of Southampton and flew west to Foynes, preparatory to the actual Atlantic crossing.

The *Caledonia* was one of the two Short "Empire" flying boats specially fitted with long-range fuel tanks in the wings, holding altogether 2,320 gallons of petrol and 176 gallons of oil; a considerable increase on the normal 636 gallons of petrol and 58 gallons of oil. The four engines were standard Bristol Pegasus Xc, common to all the "Empire" boats, each generating 740 b.h.p. for take-off using 87 octane petrol.

In order to allow for the carriage of this great weight of fuel (8 tons of petrol and about ¾ ton of oil), the maximum permissible take-off weight of the aircraft had been increased to 45,000 lb. (20.1 tons) instead of the normal 40,500 lb. (18.1 tons) at which other "Empire" flying boats were operating. This increased the wing loading from 27 to 30 lb. per sq. ft. and the power loading from 13.7 to 15.2 lb. per b.h.p. no difficulty was experienced in taking off and handling at this weight, although the take-off run was lengthened and the rate of climb was lower. Since that time, under the stress of war conditions, the same type of aircraft has operated at considerably higher weights.

Spartan Accommodation

The margin of capacity available for load was not very large. It was not, however, unsatisfactory for 2,000 miles for the year 1937, and some time later could have been considerably increased, by the use of a higher take-off weight, had the aircraft remained on Atlantic operations. The interior of the hull was a dim and echoing vista of bare metal, all furnishings having been omitted to save weight on the preliminary flights. There was, as a result, ample space for dead load.

Government meteorological facilities at Foynes and Botwood had previously been arranged, radio stations had been installed, and all the comprehensive ground services were waiting; moorings, launches, ground transport, minor repair facilities, communications, catering, accommodation and staff. Transatlantic shipping had been warned and radio schedules settled. The only requirement then lacking was weather of not too bad a nature.

The crew, a tested and experienced team, was able to undertake flying in conditions which the average trans-

* By arrangement between Imperial Airways and Pan American Airways, an aircraft of the latter company flew across the Atlantic from west to east on the same night as that of the episode described above.

RUNNING-UP. Two of the Bristol engines of *Caledonia* being tested before the Atlantic flight in front of the old Supermarine hangar at Hythe.

ALL READY: *Caledonia* on the Hythe slipway, fully fuelled and ready for launching on its historic flight.

atlantic record breaker could not face. Facilities were available which had not existed previously and full use was to be made of H/F and M/F radio. Astro-navigation was to be combined with D/F loop bearings over and above the normal solid foundation of D/R navigation. In addition, the crew were reasonably comfortable. They were well supplied with food and drink and had ample space in which to move about or rest; literally the whole aircraft to themselves. They could, if they wished, walk for miles round and round the main cabins.

The aircraft had a range of 20.1 hours, which would enable 2,854 statute miles to be covered in still-air conditions. This range was based on the following operation conditions:—

Petrol tankage	2,320 gallons (Imperial).
Mean true airspeed .. (For a stage of 2,000 miles at a mean height of 6,000ft. and a take-off weight of 45,000 lb.)	142 m.p.h.
Mean petrol consumption (On 50 per cent. power)	115 g.p.h. (0.42 lb. per b.h.p./hr.)

Thus, with a distance to be flown from Foynes to Botwood of 1,960 statute miles (great-circle), a still-air reserve of 6.4 hours was available. (Allowing 30 minutes petrol left in tanks and 15 minutes for taxying and circling each end. The maximum headwind which might then reasonably be overcome, assuming a mean headwind for the whole distance, was 20 m.p.h. This would allow an alternative alighting area within 3 hours' flying distance of Botwood, plus allowances as above, to be used.)

The Fog Danger

A dangerous enemy to be considered was fog at the western destination. Newfoundland fogs are notorious, and ample allowance had to be made to overcome any such obstacle, which might well appear at short notice, by the allowance of a fuel reserve under all conditions which would enable the aircraft to reach some place suitable for alighting outside the fog-shrouded area.

Westerly winds in the North Atlantic may frequently reach velocities of 40 to 60 m.p.h. when deep depressions are centred north of Iceland and around the southern tip of Greenland. Such conditions are most prevalent in winter, and in summer less severe weather is normally experienced. Thus, from the end of May to the beginning of October, the average headwind component for the whole trip is usually under the 20 m.p.h. level. Greater wind speeds are usually found at higher altitudes, so that in most cases an east to west crossing would be made at a fairly low level.

Low or medium altitude flying would also lessen the chances of meeting icing conditions. The great-circle course between Foynes and Botwood goes well to the north, and the freezing level in these regions, even in summer, is always fairly low. Even with modern aircraft, fitted with the latest de-icing equipment, it is always preferable to stay out of such conditions if possible.

After a two-day pause at Foynes, *Caledonia* set off on the evening of July 5th, 1937, at 18.45 G.M.T., bound for Botwood, Montreal and New York.

The crew of four may, without shame, have had some feelings of trepidation. No such feelings were apparent, however, as they were driven out to the aircraft before departure. They may, perhaps, have felt as confident as the ground staff who had helped plan and organise the service but who were not taking part in the actual flight.

The journey, for those who were left on the ground, was uneventful. All went well and regular position messages were received at hourly intervals. Weather conditions were not unsatisfactory, and only those concerned with vital radio communications and control stayed up all night watching progress and keeping in touch. Early the next morning the aircraft was well on the way and, at 10.13 G.M.T. on July 6th, *Caledonia* moored at Botwood, having completed the flight in 15 hours 28 minutes.

The voyage was made at an average speed of 126.5 m.p.h.

AIR-ATLANTIC

and the mean headwinds encountered were approximately 15.5 m.p.h.

A feeling of great jubilation swept the offices and workshops of Imperial Airways throughout the world when the success of the flight was confirmed. Quiet satisfaction was expressed, and everywhere it was thought that at last civil aviation was beginning to fulfil its destiny. It appeared certain that soon the airways would be a major component of the world's transport system. These feelings are now facts and much is owed to those pioneers who planned, organised and operated this transatlantic flight, the first which could be classed as something more than a publicity stunt.

After one day at Botwood, *Caledonia* flew to Montreal on July 8th and continued to New York on July 9th. A two-day stay in New York allowed for both celebrations and a full rest, and on July 12th preparations for the return flight commenced.

The aircraft left Botwood at 21.20 G.M.T. on July 15th and once again it was an uneventful flight, the arrival at Foynes being at 09.40 G.M.T. on July 16th. The flying time was 12 hours 33 minutes, giving an average ground speed of 159 m.p.h. with a mean tailwind of 17 m.p.h. The comparison between westerly and easterly ground speeds illustrates general Atlantic conditions to the full.

After a night stop at Foynes, the voyage to Southampton continued, finishing on July 17th; the double Atlantic crossing having been completed without incident and to schedule.

There was no triumphant home-coming to Southampton; the flight, after completion, being treated as a matter of routine. It may be presumed that some people were filled with pregnant thoughts, and surely the ancient supports of the luxury shipping lines must have trembled.

Caledonia made two more North Atlantic crossings that summer. Then in October, as the westerly headwind component increased and Botwood became ice-bound, a flight was made out to the Azores to consider the suitability of the transatlantic route via Lisbon, the Azores and Bermuda.

The aircraft had then completed its part in the preliminary transatlantic work and was transferred to normal flying on the Empire route to the Far East and South Africa.

To-day she is still ploughing the same key furrow, temporarily restricted to Durban-Cairo-Calcutta. Few who see her glide smoothly overhead, on her millionth or more mile, associate her with transatlantic commercial pioneer work.

To those who remember she brings a warm glow of hope in a future destined for the benefit of mankind and the integration of the nations of the earth.

I.C.A.N.

International Commission for Air Navigation, Past and Future

THE history of the I.C.A.N. which now meets in London at its 28th plenary session goes back to the Paris Convention of 1919 drawn up by the Air Commission of the Peace Conference. The Convention was signed on October 13th, 1919, and consisted of 43 Articles dealing with such matters as: General principles of air navigation, airworthiness, the admission of aircraft of contracting States over the territory of other contracting States (an early form of what is now known as the First Freedom), rules for taking off, landing and flying, and steps for the development of air transport.

I.C.A.N., also known as C.I.N.A.—*Commission Internationale de Navigation Aerienne*—was set up under the control of the League of Nations in accordance with Art. 34 of the Paris Convention but remained comparatively independent. It came into being in 1922 following ratification of the Convention by 14 States, including the United Kingdom, the Dominions, India and France. At the outbreak of the second World War 33 countries were party to the Commission, but this did not include the U.S., the U.S.S.R. and Germany. Since 1929, all States parties to the Paris Convention have been entitled to have two delegates on the Commission.

Designed to be a permanent body the I.C.A.N. had its seat and permanent secretariat in Paris with M. Albert Roper as Secretary-General. Seven sub-commissions—operational, legal, wireless, meteorological, map, medical and materials—and two separate committees on customs and standardisation were set up and met at regular intervals.

Amongst other things, by the terms of Art. 37 of the Paris Convention, the I.C.A.N. is competent to give a ruling in the event of disagreement between contracting States relating to the technical regulations annexed to the Convention. It has, however, never had to act as such conflict has never arisen.

The functions of I.C.A.N. may be briefly summed up under the following headings: (1) A Council charged with ensuring the application of the Convention and its normal evolution by proposing to the contracting States the amendments called for by the development of international air navigation. (2) A kind of international parliament having powers at all times to adapt the technical regulations to the needs of air traffic. (3) A tribunal settling first and last disagreements which may arise between contracting States with regard to the technical regulations which it has power to enact. (4) An advisory committee giving its opinion on questions which the States may submit for examination, and finally (5) an organisation for the collection and dissemination of all information indispensable to airmen.

The present is the final phase of I.C.A.N.'s 23 years of existence, as I.C.A.N. is to merge into the new international body set up by the Chicago Conference. But before this happens several things will have to be done: to provide a wider basis than that possible under the Paris Convention the Chicago Conference drew up a new draft International Convention and set up a Provisional International Civil Aviation Organisation (now meeting in Montreal). When the new convention has been ratified by 26 States it will come into force and countries signatory to it will renounce the Paris Convention, and consequently I.C.A.N. will go out of operation. This process, which involves considerable preparatory work both in the framing of the future permanent organisation and in technical details, is likely to take about two years. In the meantime I.C.A.N.'s work will be closely co-ordinated with that of the P.I.C.A.O., of which, as reported elsewhere in this issue, M. Roper has been appointed Secretary-General. A start in this direction will be made at the present London session of the I.C.A.N. when it will be attempted to bring the Technical Annexes of the Paris Convention into line with the Technical Annexes drafted at Chicago, so as to ensure an eventual smooth changeover. In particular the Conference will consider proposed modifications of the rules of the air and the amendment of the regulations concerning the issue of licences valid for international flying.

Opening the conference, Lord Winster said that much useful work remains to be done by the I.C.A.N., which must bridge the gap until the Provisional International Civil Aviation Organisation can get into its stride. Civil aviation, the Minister said, must unfold its wings without delay, and the task of I.C.A.N. is "to facilitate the resumption of international civil aviation on a safe and orderly basis at the earliest moment and, by continuing the study of the application of recent aeronautical and scientific developments, to ease the task of the new organisation when it is ready to take over responsibility."

CIVIL AVIATION

C.E.R.C.A.

Conclusions and Recommendations : Value of Radar

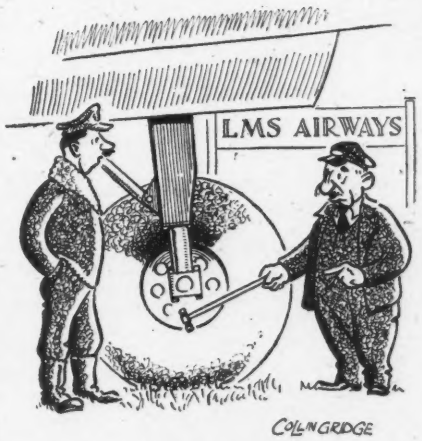
THE London meeting of the Commonwealth and Empire Conference on Radio for Civil Aviation, the opening of which was reported in *Flight*, August 16th, has been brought to a successful conclusion.

The Conference achieved a high degree of integration by the presence at all the operational-technical discussions of representatives of the regulating and providing administrations of the operators and of the technical developers. The work of the operational-technical committees has now produced clear statements of the general operational requirements for radio aids to civil aviation, including radar, of the services required from these radio aid systems, and of the equipment available for the immediate introduction.

Detailed systems were recommended to the participating Governments as most suitable for international standardisation at the first appropriate international conference. A programme was also drawn up for further research and development work on which participating Governments will base their national development programmes.

It will be recalled that before, the divergence between the European and American systems was quite considerable. To put it in a nutshell, the American system aimed at presenting the pilot with information which will enable him along specified routes to determine his position, while the European system set out to give information to the pilot no matter where he be.

In the Conference's opinion radar will play an important part in civil aviation. What it will do might be summarised briefly as follows: it will greatly assist navigation, by making it possible for the position of an aircraft to be determined much more quickly than by other methods. It will give the airfield greater and more flexible control over aircraft, and it will give the ground authorities additional information, such as identity of aircraft. At the same time, C.E.R.C.A. aims at giving the pilot fullest individual liberty, control interfering only when called for or in an emergency. Radar will act as a collision warning, it being understood that problems involved in the employment and development of equipment for prevention of air-to-ground collisions are likely to be solved earlier than those of air-to-air collisions. Finally, by fitting radar responders in dinghies, air/sea rescue work will be greatly facilitated.



"YOU'LL GET USED TO IT AFTER A BIT"

Economic Problems

Views and recommendations on the development of radar aids on Empire routes have been also dealt with and are embodied in the proceedings, which will be published and made available to the interested quarters. On the subject of light aircraft aids C.E.R.C.A. gives preference to R.T. equipment, and while it is not intended to propose making it a condition for flying, it would guarantee the freedom of flight in all zones.

The Conference advanced further the machinery for enabling participating Governments to measure the magnitude of the economic burdens in finance and man-power, and the physical burdens in weight of airborne equipment, which will be incurred in providing radio services of the kind visualised for international air routes. They recognised that very few routes could bear or would need the provision of all the aids which have been embodied in a general statement which visualises the worst possible of all the conditions which may be experienced on the least favourable of all the international routes, and the heaviest traffic conditions which may be experienced anywhere.

International Standards

The other major division of the work of the Conference was that dealing with the regulatory side of radio for civil aviation. Here the aim is international standardisation of the regulations and procedures for the carriage and use of aeronautical radio equipment. The Conference took as the basis of its work the Technical Annexes to the Final Act of the Chicago Conference of late 1944, and drafted detailed proposals for amendments. The past work of the International Air Navigation Commission contributed to the effectiveness of the redrafting process, which was directed towards annexes which should be as homogeneous and manageable as possible, containing rules of permanent nature. This would be facilitated by the proposal to transfer matters of a temporary and variable nature to separate volumes of instructions, which can be made appropriate to limited regions and can be readily amended and brought up to date.

The circumstances in which the carriage of radio equipment is compulsory, and the examination, certification and licensing of aircraft radio technicians and operators, were the subject of detailed suggested rules.

The closely related subject of the Airworthiness of Radio Equipment, so that it may be depended on to give a continuing service of the kind for which it is provided, and may not add to the hazards of flight by producing a risk of fire or of injury to the aircrew, was also covered by draft regulations considered by the Conference.

Agreement was also reached on the desirability of leaving such "preferred standards" for radio equipment as did not affect safety, to be the subject of agreement among the users. The standards adopted in the United Kingdom, which had been reached by this means, will be brought to the notice of those concerned in other Commonwealth and Empire countries as a contribution to the formulation of their policy.

All these discussions in a Commonwealth Conference, with participation by a strong delegation from the United States and by specialist officers of the U.S.S.R. Military and Trade Missions (attending in their personal capacities), are a preliminary, only, to full international discussion. They have been directed towards technical solutions which can in all essentials be put forward and supported by all the individual Commonwealth and Empire Governments concerned. These preliminary summaries of the agreed accumulated experience of a group of nations with widely varying regional conditions will, it is hoped, greatly simplify the conduct of the corresponding discussions on the wider international plane.

In the meantime C.E.R.C.A. will keep in close contact with the I.C.A.N., and from the integrated work and experience of these two bodies a widely accepted and really efficient pattern should emerge.

CIVIL AVIATION NEWS

P.I.C.A.O.

THE Interim Council of the Provisional International Civil Aviation Organisation which is now meeting in Montreal has taken a step forward with the appointment of temporary committees to consider finance, personnel and other organisational problems.

The committees will draw up tentative drafts for submission to the Interim Council of the Provisional International Civil Aviation Organisation.

The work of the committees is not expected to last more than a week and later they will give way to three standing committees—Aeronautical, Air Transport and International Convention.

Dr. Edward Warner has been elected president of the council, in which capacity he will become a permanent and salaried official of the international organisation as soon as he is released from his present connection with the U.S. Civil Aeronautics Board. Dr. Albert Roper, the present secretary-general of the I.C.A.N., a veteran in international air co-operation, has been elected secretary-general of the P.I.C.A.O. and is expected to take up his new duties at Montreal.

Air Chief Marshal Sir Frederick Bowhill, representing Britain on the Interim Council, is chairman of the temporary organisation committee. Sir Guranath Bewoor, of India, heads the Finance Committee, and Dr. J. Reiser, of Czechoslovakia, leads the committee on personnel.

Dr. Copes Van Hasselt, of the Netherlands; Dr. Chang Kai-Ngau, of China, and Senor Gullarmo Eliseo Saurez, of Columbia, have been elected vice-presidents of the Interim Council.

Representatives of the Interim Council of the Provisional International Civil Aviation Organisation went into closed session to discuss the annual budget of £200,000 which had been drawn up by a Canadian Preparatory Committee as necessary to maintain the proposed permanent secretariat of 125 to 140 employees.

Although this figure could not be regarded as final, Sir Gurunath Bewoor, chairman of the finance committee of the organisation, said that he expected the actual budget would be along the lines set by the Canadian committee.

The 54 nations which accepted the Chicago Agreement to set up an international civil aviation organisation will all share in the expense but not in equal proportions; the Interim Council will discuss the possibility that member nations sharing in the expense would also participate in the profits derived from the operations of the air organisation.

In a discussion on the rival merits for aviation purposes of the English system of measurement and the metric system it was suggested that the possibility of getting the population of N. America to think in terms of the metric system was remote. Weather reports from international airports in N. America would therefore have to be made in terms of both systems, if the metric system should be adopted. It was assumed that nautical miles will be the standard unit for air navigation on international flights, particularly not only over oceans, but also on overland routes.

I.C.A.N. MEETING

THE 28th plenary meeting of the International Commission on Air Navigation opened in London with delegations from 16 countries present. Nine other delegations are expected to arrive.

Lord Winster, the Minister of Civil Aviation, opened the session, and Sir William Hildred, Director General of Civil Aviation, was unanimously elected chairman of the conference.

Delegates to the I.C.A.N. conference were the guests of the British Government at a reception at the Dorchester.

T.C.A.

TRANS-CANADA AIRLINES started a fourth daily flight on August 1st from Montreal to Sydney, N.S., at the eastern end of Canada. A fourth transcontinental route to Western Canada is expected to follow.

The Canadian airline is also to open soon the international service from Duluth, Minn., to Port Arthur—Fort William, Ont., with feeder routes from there to connect with its transcontinental route. Seaplane service to mining areas in north-western Ontario are also contemplated.

Under the Two Freedom clause of the Chicago Air Agreement arrangements have been completed for the use by T.C.A. of the bad-weather route through Detroit, Milwaukee, Minneapolis to Fargo and Winnipeg, in place of the regular route from Toronto north of the Great Lakes to Winnipeg.

T.C.A. is scheduled to start commercial transatlantic service from Montreal to Great Britain on September 1st, using converted Lancasters, at rates competitive to those of other transatlantic services.

U.S.S.R.—U.S.

FIRST mention of a Russian plan to establish an air line to the U.S. across Western Europe was made in an article by Air Marshal Astakhov, chief of the Central Administration of the Soviet Civil Air Fleet, in an article broadcast from Moscow.

FORCED LANDING

A HOME-BOUND B.O.A.C. air liner carrying fifteen passengers from South Africa force-landed at Lisbon. The passengers continued the journey in a Dutch aircraft.

FRANCE—CHILE

THE Paris-Santiago passenger air service is to be resumed in February as a result of negotiations between a representative of Air France—the French Civil Air Line Corporation—and the South American authorities.

The service will be operated twice weekly via Dakar, Pernambuco and Buenos Aires.

PAN AMERICAN VISIT

ANTICIPATING the early resumption of commercial Clipper services on a peacetime basis between the United States, Ireland, England and the Continent, six officials of Pan American World Airways visited Dublin to review final details with representatives of the Government and Aer Lingus.

Prominent among the subjects being discussed is the use of the Shannon Airport—Rineanna—by land-type Clippers which Pan American hopes soon to operate across the Atlantic. Having inspected the terminal building now nearing completion at Rineanna, the party consider it well suited to their immediate requirements. They also visited Foynes, which will still continue to serve the company's marine aircraft.

CANADIAN BURNELLI

FIRST Burnelli *Flying Wing* aircraft built in Canada was ready for test flights late in July at Montreal. Canadian Car and Foundry, Ltd., Montreal, sole licensee of Burnelli patents in Canada, built the prototype as a passenger-freight aircraft for 24 passengers and 700 cubic feet of cargo space. T.A.C.A. Airways, which operates in Central America and is the pioneering work of the New Zealander, Lowell Yerex, have shown an interest in the aircraft which has been designed to make use of relatively short fields.

The aircraft has a payload of 3 to 3½ tons, maximum speed of 200 miles per hour, range of 2,000 miles. It is equipped with passenger compartment 20ft. wide, a freight compartment 20ft. long and 6ft. high, with doors 6ft. wide to allow loading of automobiles and tractors and long pieces of freight as lumber. It has an 86ft. wing span and is powered with two 1,200 h.p. Pratt and Whitney engines.

INSTRUCTIONS

A VOCATIONAL training scheme to provide members of the Aeronautical Engineers' Association with instruction on hydraulic equipment for the latest type of civil air liners was inaugurated at Swindon. Similar lectures are to be organised throughout Great Britain.

The scheme organised by the Dowty Equipment, Ltd., and the Aeronautical Engineers' Association—a registered trade union recognised by the B.O.A.C., the majority of whose members are R.A.F. men—will provide instruction which has been hitherto unavailable outside official channels and which will be invaluable to those who wish to enter civil air line employment.

Two aspects are covered by the training scheme: the first for the fitter who has been working on hydraulics but is not conversant with civil air line procedure, and the second to give the fitter who has been employed in some other category during his service career, the all-round versatility demanded by civilian employers.

An Aircraft Position Indicator

Neat Instrument Which Shows Passengers from Minute to Minute Their Whereabouts on a Strip Map

"YOUR passengers don't know what's below. They can, by referring to 'FRED,' the minute-to-minute aircraft position indicator." This is the slogan chosen by Wing Cdr. C. Hole in connection with a neat instrument he has just evolved. It might be explained that "FRED" is formed by the initial letters of "Flight Route Easily Determined."

On a cross-country flight passengers are always interested in knowing just where their aircraft is, whether there are any interesting features or landmarks in view, and whether their machine is keeping its course and its time-table. Not all commercial aircraft will be carrying "hostesses," and, even if they do, a map which gives all the information at any moment is a great asset.

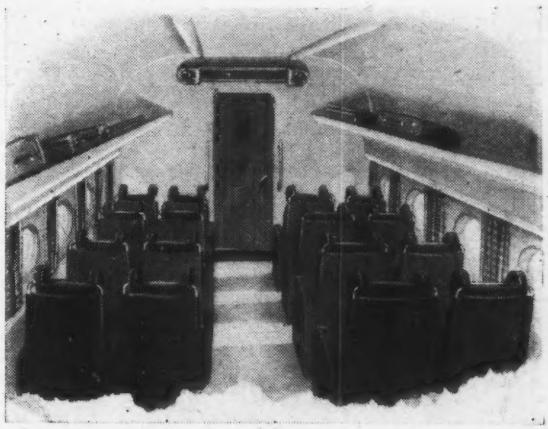
Self-contained Unit

The Hole position indicator comprises a strip of map of the route, over which a small model aircraft progresses. The model is driven by an integral prime mover, which can, of course, be either clockwork or an electric motor. The main point is that it is self-contained and needs no wiring-up or other connection to the aircraft, other than that of fixing it to a wall or bulkhead. The speed of the model can be set to tally with the ground speed of the aircraft, the range of its equivalent speed being from 100 m.p.h. to 400 m.p.h.

One drawback of the indicator is that it must necessarily show the route as a straight line, and thus it must fail somewhat to give a realistic impression on routes where changes of course occur several times. This, however, is remedied to some extent by indicating on the map any angular changes of course.

The map is stowed on two spools and covers some 8,000 miles on a scale of 20 miles to the inch, or 4,000 miles on a scale of 10 miles to the inch. A route length of approximately 600 miles is under immediate observation, and if a time-table is posted near the instrument the passengers can at any moment see whether or not the machine is keeping to it.

Not the least valuable psychological effect of the device is that when the aircraft is flying in fog or over cloud, so that the ground is obscured, passengers can see on the map how far they have progressed (if the pilot is on his course!) and thus avoid that "lost" feeling.



The Hole position indicator shown mounted on the iron wall. As an alternative two can be used, one on each of the side walls. In the upper picture of the indicator itself can be seen the model, and the airspeed indicator and clock at each end of the instrument.

LOW-FLYING IN CANADA

THE crash of the United States Army Air Force bomber into the Empire State Building had its reverberations in Toronto when Mayor Robert Saunders issued a statement declaring that too many liberties were being taken by aircraft flying over the city, and that low-flying over the metropolitan area must come to an end. Mr. Saunders cited as a typical example the fact that someone has been flying an aircraft too close to the roof of the Mayor's house.

The Mayor disclosed he had written officials of the R.C.A.F. in Ottawa, the Civil Aviation branch of the Department of Transport and of the de Havilland aircraft plant at suburban Wetston requesting that existing low-flying regulations be tightened up and their enforcement be more stringent.

Later, Mayor Saunders carried the anti-low-flying campaign a step farther when he induced the Board of Control to approve a request to the Dominion Government to institute a law setting out minimum heights at which aircraft may fly over Canadian cities.

The stunt of two Mosquito aircraft which flew low over the city and attracted the attention of thousands and the queries of scores—including the Mayor—provoked the action.

Mr. Saunders said there is no set height at which aircraft must fly over Canadian cities. Aviation officials say the aircraft must keep high enough to glide to a landing outside the cities in case of trouble. In Toronto that height is estimated at about 3,000 feet.

At Ottawa, a Transport Department official explained that minimum heights for flying over cities were never defined in Canadian flying regulations because the circumstances were not equal in every city. He quoted the regulation as saying:

"No aircraft shall fly over any city, town or village except at such an altitude as will enable the aircraft to alight outside the city, town or village should the means of propulsion fail through mechanical breakdown or other cause, except for the purpose of alighting or taking off from a licensed airport within the limits of the city, town or village."

The official added that the minimum height for a Mosquito would be lower than, say, for a Hurricane, because the Mosquito has two engines and can remain airborne if one engine fails. He said that common law also covered low flying, for anyone could lay information against a pilot flying too low over a city on the grounds that he was committing a public nuisance. This was covered in every city ordnance.

Aircraft as Life-savers

Evacuating Wounded : Repatriating Prisoners of War

By MAJOR F. A. de V. ROBERTSON, V.D.

"I WISH personally to commend your Command for this great achievement, and to ask you to pass on my sincere thanks to all the air and ground crews who were responsible for carrying out this very fine feat. It was a contribution to human happiness for which the Air Force can remain for ever proud."

These were the concluding words of a message sent by General Eisenhower to Air Vice-Marshal Darvall, A.O.C. No. 46 Group of Transport Command, in June last. The Group had during April and May lifted some 80,000 repatriates from the Continent for return to their homes.

Those who are still suffering from the losses and shock of the bombing of London and other British cities, and those who are filled with horror at the power of the atomic bomb, may have been wishing that the art of flying had never been discovered, and may find it a surprise that such an authority as the Supreme Commander in Europe should acclaim the work of aircraft as "a contribution to human happiness." But, in truth, that is the proper role of aircraft. They ought not to be regarded as instruments of destruction, but as agents of mercy.

Long before the guns had ceased fire the R.A.F. and the U.S. Army Air Force were busy bringing back the released prisoners of war. Earlier still they had been evacuating wounded and sick from the combat zones. In fact, the history of that side of R.A.F. work goes back much further than the outbreak of the recent wars. Not long after the 1918 Armistice designers were producing ambulance aircraft. Early in the twenties we remember one such Avro machine called the Andover, and there were others.

Probably the first place in which wounded and sick were evacuated by air was Iraq. The numbers of casualties were small in the little affairs with turbulent tribesmen in that country; but some experience was gained, and the advantages of getting cases to hospital quickly, as well as avoiding the hardships of ground transport in an Eastern land, were obvious from the first.

In the wars against the Axis air evacuation first became a matter of major importance in what was then called the Western Desert—how far to the east it seemed when Alexander had conquered Tunisia and invaded Sicily and Italy! Some very fine work was done there, though, compared with what had happened recently in Northern Europe, it now seems like a small-scale experiment.

Air Ambulances

There were few air ambulances in the Middle East Command, and presently it became apparent that regular air ambulances were not a desirable class of aircraft. They had to fly out to the front empty (except for medical orderlies), which was a wasteful way of using aircraft. They ought to carry a useful load each way. So transport machines, Dakotas and others, were equipped with fittings to which stretchers could be made fast, and then they were used to carry out to the front line stuff which was needed, and they brought back wounded and sick on the return journeys. In that way the aircraft were made useful on both trips.

When the famous Eighth Army reached Tunisia and came under the general command of General Eisenhower another small complication cropped up. Nobody ever dreamed of making a difference between British and American casualties; but the stretchers of the two armies were of different patterns. So the British transports were modified to take either type of stretcher, and the same was done to the American machines. Then all could work together as one combined team, which was always the ideal from the moment that General Eisenhower became Supreme Commander.

The entry into Tunisia brought about a change in the route of those machines which were evacuating casualties. There was no point in taking British wounded back all those dreary miles across the desert to the hospitals in Egypt. Only Indian casualties were sent that way, which brought them nearer to their homeland. There were hospitals in Algiers and other places in N.W. Africa, and from them it was a straightforward business to ship British and American cases to Great Britain. So the majority of the transports began to fly westward, and from the African ports they could pick up the munitions which arrived from America and England. The British forces were no longer dependent upon the long haul round the Cape to Egypt. It is one of the marvels of military history that they were able to live on it and thrive on it for so long.

The schemes for the evacuation of casualties by air were always being overhauled and improved. As the invasion went on through Sicily and Italy a novel body came into existence at every airfield of departure. It was called a casualty air evacuation unit, and it usually held 30 patients ready to embark immediately as opportunity arose. This little unit was affiliated to a mobile field hospital about two miles away, which could accommodate from 40 to 100 patients, and could even carry out major operations.

R.A.F. and R.A.M.C.

Of course, most of the casualties were soldiers, and they naturally came first under the care of the R.A.M.C. But the air evacuation scheme was entirely under the charge of the R.A.F., and once the patients were handed over to it, the R.A.F. Medical Branch took charge of them. The U.S. Army Air Force worked in close harmony with the R.A.F.

All cases are not suitable for transport by air. That is a subject which has been closely studied for a long time past by the R.A.F. Medical Branch. During the Sicilian and Italian campaigns the Army doctors also studied it, and made considerable progress in it. It naturally saved time and trouble if the Army refrained from sending unsuitable cases to the casualty air evacuation units.

Before leaving the Middle East and the Mediterranean, we should mention that air evacuation was used during the little campaign in Syria; while during the rebellion in Iraq casualties from Habbaniya were flown away to Egypt in old Vickers Valentias, which took off from no man's land before dawn each day, under the fire of the rebels.

It should also be noted that only the regular air ambulances were marked with the red cross of Geneva. The transport machines could not be so marked, because they only carried wounded on their return journeys, and on their forward flights were full of munitions and were therefore legitimate targets for enemy aircraft. An essential basis for the whole plan was air superiority by our fighters, and that was obtained from the days of Alamein onwards—and, in fact, even before the retreat to that historic defence position. If the enemy fighters had had command of the air, our losses in wounded might well have been grievous.

Now let us turn to the invasion of Normandy and the operations which followed it. There the supremacy of our fighters was, if anything, even more complete, and the same system of using transport machines to bring back casualties on their return journeys was followed. It was a short haul at first, and men were often back in hospitals in England in a very few hours after having been hit. One case may be mentioned, but there were many others. A

AID FOR TITO : Dakotas of R.A.F. Transport Command, which evacuated some 10,000 Yugoslav wounded, flying over the Balkan coast.

fighter pilot was shot in the leg in a dog fight with a German machine and made a successful landing on an airfield within the Allied lines. He was given first aid by the M.O. on the spot, and just then a Dakota landed with supplies from England. It only waited a few minutes after discharging its freight, but the wounded pilot was put on board. He received treatment in England only five hours after taking off on his mission.

Then as the Allies advanced they began to capture camps full of their own prisoners of war. Then Bomber Command came to the rescue. In this case there was no need for attachments to hold stretchers. The men could sit in the aircraft, and 24 at a time were packed into a Lancaster or a Stirling. Most of them had never flown before, and careful instructions were given them about not moving about so as to disturb the balance of the bomber. They mostly enjoyed the flight, and few cases of air sickness were recorded. One Australian private from Perth in Western Australia remarked that he had been in German prison camps for four and a half years, and had never seen England. "I didn't think I'd come by air," he said. R.A.F. prisoners were only too delighted to feel themselves in the air once more. All the passengers were filled with emotion when the shores of Old England first came into their view through the mist.

Great Britain is not exactly a land of luxury at the present time, but every effort was made to give the returned prisoners of war a hearty welcome. When their bomber landed they were taken to some room, sometimes a rehabilitated hangar, where a dainty meal was ready for them, with W.A.A.F. girls to wait on them. One can picture for oneself how the presence of British girls cheers up men who have been for years in the hands of the Germans. "Oh, woman," exclaimed Sir Walter Scott (we will omit the next few lines) "when pain and anguish wring the brow, a ministering angel thou!!" The girls loved the work, and one warrant officer has said that they would turn up for duty when they were supposed to be resting, and it was hard to make them go back again.

Some W.A.A.F. nursing orderlies went in a transport to fetch back wounded, and the machine landed on an airfield which the Germans were shelling. They came back bringing bits of Normandy on their hands and uniforms, but they got up and did their job when it was time to load on the casualties.

Now all the prisoners of war and the sick and wounded have been brought back from the Continent, and the next task is to get back all Allied prisoners and civil internees from the hands of the Japanese. It is feared that many of them will be in poor health, and mostly suffering from malnutrition. It has been decided that it would not be wise to fly them all home. It would save time, but travelling by air is a strain to some people who are in a weak physical condition. A long sea voyage, it is thought, will be the best treatment for them. We feel rather doubtful of the wisdom of this decision. A calm sea voyage in a temperate climate is one of the best ways of convalescing, but the monsoon will not be over until near the end of September, and sea sickness is not the best treatment for malnutrition. Moreover, it may be very hot on some stages of the voyage, the Red Sea, for instance, before the cold weather has properly set in.

However, there has been some evacuation by air in the Pacific already. Naval sick and wounded have been taken by hospital ship to certain forward island bases. Dakotas of Transport Command have been flying to these islands with stores, and bringing the casualties back to Australia. The first arrivals from the battle of Okinawa were accompanied by a Sister of the Queen Alexandra Royal Naval Nursing Service, who is the first flying Sister of the Navy.

One little story adds a humorous touch to the universal joy over the return of our prisoners of war. We know of one who has been in a camp at Graz, in Austria, and he says that the climate of England this summer will not compare with that of Austria. We believe him. However, he does not say that he is sorry to be back home, or that he would like to return. He will put up with this English summer.

APPRECIATION

THE Air Council has sent the following message to all ranks of His Majesty's Air Forces: "With God's help, final victory has been won. The last enemies of the free world have laid down their arms. At this supreme moment, the Air Council send greetings and congratulations to all ranks of His Majesty's Air Forces from all parts of the British Commonwealth and Empire, and to all who have served with them in proud companionship, men and women alike. The Air Council remember also the gallant Air Forces of our Allies. . . ."

After commending their achievements, the message ends: "We remember at this hour all those of the Air Forces who have given their lives, and our heartfelt sympathy is with the bereaved. We pay tribute to those still with us who bear the honourable scars of service.

"To all, of whatever rank or calling, of whatever race or creed, who have played their part in the epic struggles of the air, the Council express their grateful appreciation. And as His Majesty's Air Forces turn now to the new tasks that lie ahead, to bring succour to the peoples lately enslaved and to keep the peace so dearly won, the Council send them best wishes for a future worthy of their illustrious past."

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

THE SINKING OF THE "BISMARCK"

Rodney, Not *Renown*

MY attention has been drawn to a sentence on page 85 of your issue of July 26th to the effect that *King George V* and *Renown* silenced the German battleship *Bismarck*. *King George V's* consort was the battleship *Rodney*, not the battle-cruiser *Renown*.

Renown steamed north-west from Gibraltar with *Ark Royal* and the rest of Force H to close the ring, but after *Hood's* disaster the Admiralty ordered Admiral Somerville not to engage with the lightly armoured *Renown*. B. STOKES.

[We are grateful for the correction, and apologise for the slip.—ED.]

REFUELLING IN THE AIR

Operational Information Wanted

YOUR very interesting article in the August 23rd issue on Sir Alan Cobham's modern system of refuelling in the air has drawn attention to a method of extending range or increasing payload which may well be of great importance in future air transport over long ranges.

That the technical problems have been solved seems clear from the article, but one would like to know something about the operational and economic sides. By "operational" I mean the percentage of distance along a route at which the refuelling should take place in order to give the maximum payload and enough fuel (with margin for winds, etc.) to get to the destination.

On the economic aspect, it would be interesting to learn how the apparent increase in payload really would work out in practice. While, technically, it is true that the payload may be increased even to the extent of doubling it, it does seem to me that the cost involved might well be such as to nullify the advantage of the greater payload. For instance, take the question of fuel alone; whether this is carried in the "receiver" or in the "tanker" appears to matter little. It will still be consumed, and it will still have to be paid for. Moreover, after each refuelling the "tanker" has to return to base, thus using fuel in a non-paying way. May we have some of these problems elucidated, please?

[We have every hope that Sir Alan Cobham and his staff on Flight Refuelling, Ltd., will oblige.—ED.]

CENTRIFUGAL FORCE

Really So Simple

HAVING read Flt. Lt. Cohen's letter in *Flight*, August 16th, with growing amazement and perplexity we would venture to point out that for a body moving in a circular path of radius r feet at V feet/second.

$r = V\ w$ where w is the angular velocity expressed in circular measure.

Hence $V^2\ r = wV$ (by direct substitution).

We are at a complete loss to account for the rest of Flt. Lt. Cohen's letter.

FLT. LT. MAJENDIE,
F/O. WATKINSON,
F/O. PARKINSON.

A Simple Solution to a Problem

FLT.-LT. COHEN is quite correct in saying that the formula given by him in your issue of August 16th cannot possibly be right. There is, however, a very simple solution to his problem, which may put him out of his misery. It is as follows:

Centrifugal force $= \frac{W}{g} \cdot \frac{V^2}{r}$

Now $V = r\omega$, where ω is the angular velocity in radians per sec.

Then $\omega = \frac{\pi\alpha}{180}$

$\therefore V = \frac{\pi\alpha}{180} \times r$

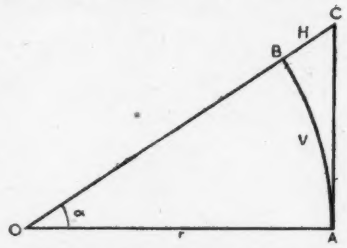
and centrifugal force $= \frac{W}{g} \cdot V \cdot \frac{\pi\alpha}{180}$

V being velocity in ft./sec., and W the weight in lb.

J. D BLYTH. (Lt./Col.).

And a More Comprehensive One

I HOPE the following may help to put Flt. Lt. Cohen out of his centrifugal torment (*Flight*, 16.8.45).

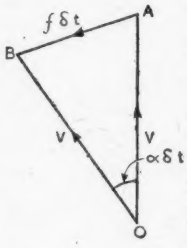


$OA = r = OB$
$< AOB = \alpha$
arc $AB = V$
$BC = H$

In the first place, using his diagram, it is easily seen that arc $AB = V = r\alpha$ (α being in radians) and that $AC = r \tan \alpha$. Hence his unproved assertion that $AC = \text{arc } AB = V$ is true only for very small values of α, when $\alpha \doteq \tan \alpha$. Amending his proof accordingly, we obtain

$$BC = H = V\frac{\tan \alpha \tan \frac{\alpha}{2}}{\alpha}$$

But the point is, what justification can there be for stating that H represents the centrifugal force? The diagram is, if anything, a velocity diagram, so no distance on it can possibly represent an acceleration, let alone a force—and in this connection one should add that the expression, $\frac{V^2}{r}$ gives the centrifugal *acceleration*, and must be multiplied by the mass of the aircraft to give the centrifugal *force*.



The adjacent vector diagram is required where OA, OB represent the magnitude and direction of the aircraft velocity at the beginning and end respectively of a short period of time δt, α being the angular velocity. The vector AB represents the change in velocity $f\ \delta t$ in that time, f being the centrifugal acceleration. Using the well-known sine formula, we have

$$\frac{f\delta t}{\sin\left(\alpha\delta t\right)} = \frac{V}{\sin\left(90° - \frac{\alpha\delta t}{2}\right)} = \frac{V}{\cos\left(\frac{\alpha\delta t}{2}\right)}$$

But since $\alpha\delta t$ is small, we can write $\sin(\alpha\delta t) = \alpha\delta t$ and $\cos\left(\frac{\alpha\delta t}{2}\right) = 1$

$$\therefore \frac{f\delta t}{\alpha\delta t} = V \text{ or } f = V\alpha,$$

which gives the centrifugal acceleration in terms of the airspeed and angular velocity only. This is, I take it, the formula Flt. Lt. Cohen requires.

Of course, α is here in radians/sec., so that if R is the "rate" of turn (i.e. the number of 180 degrees turns executed per minute), we can rewrite this expression as

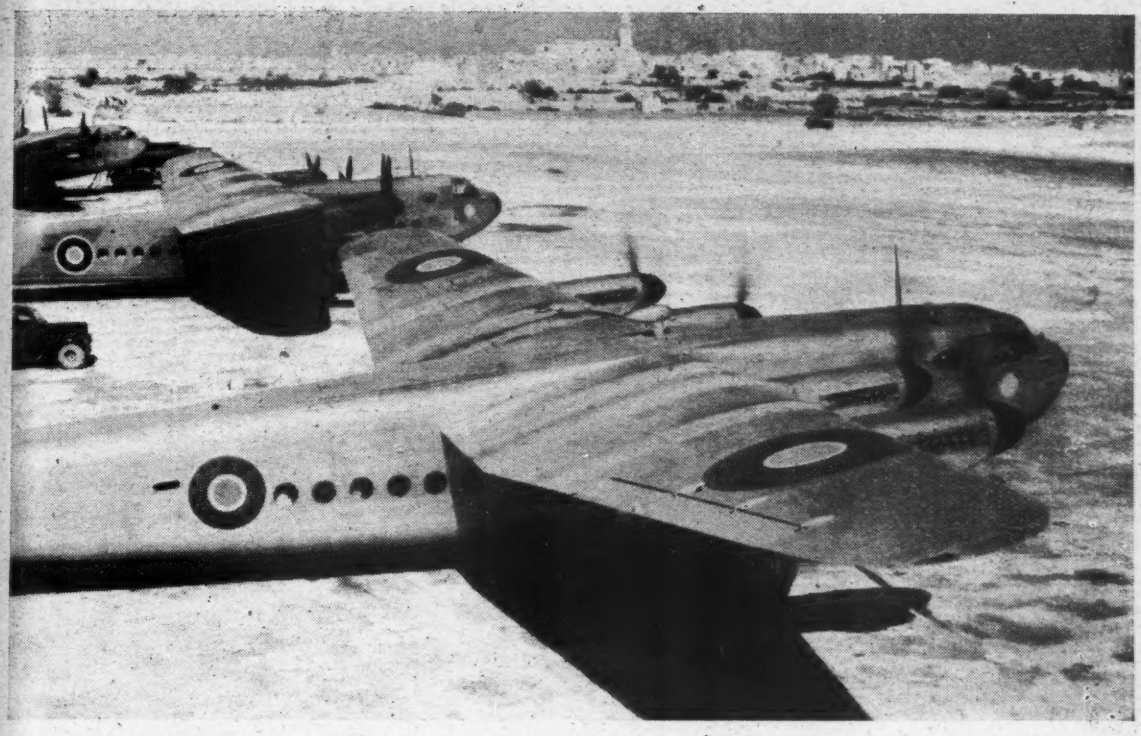
$$f = VR \times \frac{\pi}{60} \times \frac{22}{15}$$

V now being expressed in m.p.h. and f in ft./sec.^{2}.

It is now apparent that the correction factor K_a is required in the original formula to reconcile the incorrect term $V \tan \alpha$ (which, as I have shown, bears no dynamical or geometrical relation to Flt. Lt. Cohen's diagram) with the correct one $V\alpha$, since $\tan \alpha$ increases more rapidly than α, though for small values of α they are very nearly equal. For large rates of turn, however (e.g. Rate 4, or 12 degrees per second), I'm afraid the formula $f = V \tan \alpha$ would be very far from the truth.

Finally, may I point out that the equation $f = V\alpha$ may be derived directly from the usual form $f = \frac{V^2}{r}$, which Flt. Lt. Cohen apparently accepts, by noting that $V = \alpha r$ for circular motion.

JAMES R. PALMER (F/O).



Transport Command's most important job in the near future will be bringing home thousands of British war prisoners from the Far East. Many will be flown in Yorks, such as these, seen here at Malta, on their way out to the Far East.

SERVICE AVIATION

Royal Air Force and Naval Air Arm News and Announcements

Awards

THE KING has been graciously pleased to approve the following awards in recognition of gallantry and devotion to duty in the execution of air operations:—

Distinguished Service Order

F/O. B. M. RIDGWAY, R.A.F.V.R., No. 240 Sqn.—As captain, navigator and second pilot of aircraft respectively, this officer, Flt. Lt. Smith and Flt. Sgt. Sellars have completed many operational missions. The results obtained are a splendid testimony to their outstanding qualities of skill, fortitude and determination. On one occasion they successfully completed a sortie in the face of extremely adverse weather. At one stage of the flight a severe tropical storm was encountered. Turbulent conditions and fierce rain made the aircraft almost uncontrollable at times, and frequent alterations in course had to be made. Nevertheless, F/O. Ridgway, well supported by Flt. Lt. Smith and Flt. Sgt. Sellars, flew back to base and effected a safe landing.

Act. Wing Cdr. R. J. WALKER, R.A.F.O., No. 45 Sqn.—In March, 1945, this officer and Flt. Lt. Harper were pilot and navigator respectively of an aircraft detailed to attack an important enemy bridge in Burma. The target was well defended. Despite this, Wing Cdr. Walker made several runs over the target before releasing his bombs. As he made a final run over the target to secure a photograph the aircraft was hit. The windscreen around the pilot's compartment was smashed. Wing Cdr. Walker was cut about the eyes and temporarily blinded. Flt. Lt. Harper at once took over the controls and flew clear of the target. He then rendered first aid to his injured comrade and afterwards assisted in flying the aircraft to base. Wing Cdr. Walker's sight was badly impaired, but, at the third attempt, he brought the aircraft down safely. He set a fine example of courage and determination in the face of much physical distress. Flt. Lt. Harper also displayed fine qualities. Cool, resolute and resourceful in moments of great stress, he proved himself to be a worthy crew member.

F/O. J. F. MOONEY, R.C.A.F., No. 625 Sqn.—F/Os Mooney and Harding were pilot and navigator respectively in an aircraft detailed to attack Plauen one night in April, 1945. Early on the outward flight the front windscreen became badly smeared with oil owing to an external leak. Although this obscured his vision, F/O. Mooney flew on. A little later the starboard inner engine became defective. The propeller had to be feathered. Shortly afterwards the port outer engine had to be put out of action. Despite this, F/O. Mooney was determined, if possible, to reach his objective. Coming down to a much lower level and increasing his speed, he flew on. Although deprived of the full use of the navigational aids, F/O. Harding navigated the aircraft to the target with great skill. Whilst over the area much anti-aircraft fire was directed at the bomber. Several hits were sustained. Nevertheless, F/O. Mooney pressed home a most determined attack. The aircraft was losing height as he turned for home. When nearing Liege the starboard outer engine caught fire and had to be put out of action. Height could no longer be maintained. F/O. Mooney gave the order to abandon aircraft, and ensured that all members of his crew had got clear before he himself jumped at 500 feet. After reaching the ground F/O. Mooney collected his comrades together, and within a very short time they returned safely to their unit. On this notable sortie this officer displayed the highest standard of skill and courage, coupled with superb captaincy. F/O. Harding also proved himself to be a most valuable crew member, showing skill, coolness and devotion to duty in the face of great difficulties.

Bar to Distinguished Flying Cross

Act. Sqn Ldr. N. N. PARKER, D.F.C., R.A.A.F., No. 97 Sqn.

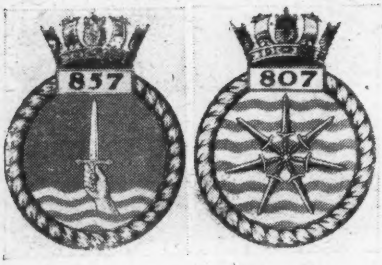
Flt. Lt. R. W. BOARD, D.F.C., R.A.A.F., No. 453 (R.A.A.F.) Sqn.

Flt. Lt. P. C. CORNISH, D.F.C., R.A.A.F., No. 83 Sqn.

Flt. Lt. W. S. WALKER, D.F.C., R.A.A.F., No. 156 Sqn.

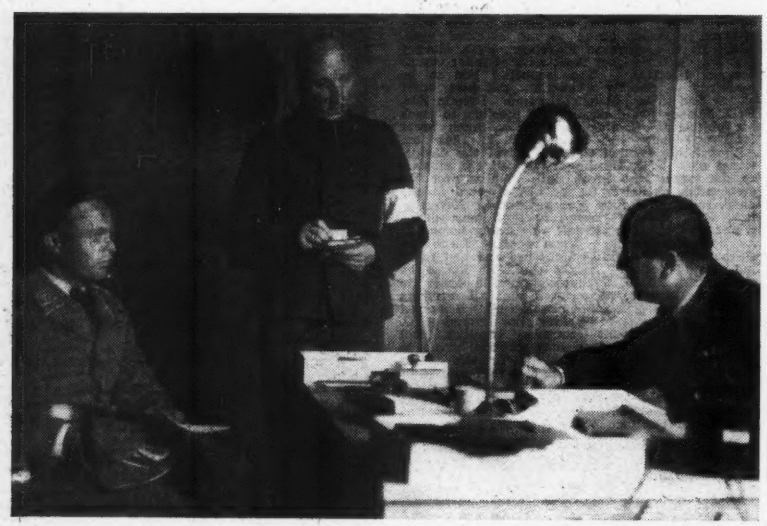
Distinguished Flying Cross

P/O. R. A. J. DAMERELL, R.A.F.V.R., No. 7 Sqn.
P/O. F. B. G. DELORIE, R.A.F.V.R., No. 460 (R.A.A.F.) Sqn.
P/O. T. R. D. EAKIN, R.A.F.V.R., No. 635 Sqn.
P/O. R. A. FORSDYKE, R.A.F., No. 405 (R.C.A.F.) Sqn.
P/O. T. D. GEARY, R.A.F.V.R., No. 76 Sqn.
P/O. A. C. GILBERT, R.A.F.V.R., No. 149 Sqn.
F/O. L. W. GOLDEN, R.A.F.V.R., No. 115 Sqn.
P/O. A. P. P. GOSTLING, R.A.F.V.R., No. 582 Sqn.
P/O. J. S. GURNETT, R.A.F.V.R., No. 102 Sqn.
P/O. J. R. HACKER, R.A.F.V.R., No. 35 Sqn.
P/O. M. W. HANHAM, R.A.F.V.R., No. 35 Sqn.
P/O. N. A. HAWKINS, R.A.F.V.R., No. 9 Sqn.
P/O. H. E. HAYES, R.A.F.V.R., No. 619 Sqn.
P/O. J. P. W. HEATHER-HAYES, R.A.F.V.R., No. 619 Sqn.
P/O. A. J. HEAL, R.A.F.V.R., No. 10 Sqn.
P/O. R. G. HENDERSON, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
P/O. R. A. HOLLINGSWORTH, R.A.F.V.R., No. 102 Sqn.
P/O. I. K. HOLNESS, R.A.F.V.R., No. 467 (R.A.A.F.) Sqn.
P/O. J. G. HOWELL (since deceased), R.A.F.V.R., No. 692 Sqn.
P/O. G. HUGHES, R.A.F.V.R., No. 7 Sqn.
P/O. W. A. R. KINGSHOTT, R.A.F.V.R., No. 158 Sqn.
P/O. N. W. LARMAN, R.A.F.V.R., No. 431 (R.C.A.F.) Sqn
P/O. T. LATHAM, R.A.F., No. 102 Sqn.
P/O. H. LEES, R.A.F.V.R., No. 433 (R.C.A.F.) Sqn.
P/O. H. LUXTON, R.A.F.V.R., No. 150 Sqn.
P/O. B. G. MCPHERSON, R.A.F.V.R., No. 10 Sqn.
P/O. W. R. MILLERSHIP, A.A.F.V.R., No. 608 Sqn.
P/O. R. E. MORLEY, R.A.F.V.R., No. 77 Sqn.
P/O. E. C. NORVELL, R.A.F.V.R., No. 77 Sqn.
P/O. H. R. OLDLAND, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
P/O. E. R. G. PARKER, R.A.F.V.R., No. 102 Sqn.
P/O. E. C. PARRISH, R.A.F.V.R., No. 102 Sqn.
P/O. N. F. PENNY, R.A.F.V.R., No. 578 Sqn.
P/O. E. C. PICKETT, R.A.F., No. 102 Sqn.
P/O. A. F. PINDER, R.A.F.V.R., No. 420 (R.C.A.F.) Sqn.
P/O. J. L. POGSON, R.A.F.V.R., No. 460 (R.A.A.F.) Sqn.
P/O. H. H. POWELL, R.A.F.V.R., No. 150 Sqn.
P/O. P. S. V. PREECE, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
P/O. P. J. RAMWELL, R.A.F.V.R., No. 9 Sqn.



(Left) Badge of No. 857 Sqn. Naval Air Arm, "Animis Opibusque Parati" (Prepared in minds and resources). On a blue field a hand proper issuing from water barry wavy in base white and blue, grasping a sword erect, white pommel and hilt gold. (Right) Badge of No. 807 Sqn., Naval Air Arm, "Quoquoversus Feriturí" (Ready to strike in all directions). On a field barry wavy of 14 white and blue seven daggers proper, pommels and hilts gold to the centre. (Explanation, the Squadron's suggestion).

P/O. W. C. Roddham, R.A.F.V.R., No. 76 Sqn.
P/O. D. W. Smith, R.A.F.V.R., No. 424 (R.C.A.F.) Sqn.
P/O. D. R. Smyth, R.A.F.V.R., No. 426 (R.C.A.F.) Sqn.
P/O. R. B. T. Sprintall, R.A.F.V.R., No. 77 Sqn.
P/O. A. C. Stanley, R.A.F.V.R., No. 10 Sqn.
P/O. K. H. F. Staple, R.A.F.V.R., No. 51 Sqn.
Flt. Lt. A. Smith, R.A.A.F., No. 240 Sqn.—(For citation see F/O. Ridgway, D.S.O.)
Flt. Lt. F. J. Harper, R.A.F.V.R., No. 45 Sqn.—For citation see Wing Cdr. Walker, D.S.O.)
F/O. H. H. Harding, R.C.A.F., No. 625 Sqn.—(For citation see F/O. J. F. Mooney, D.S.O.)
Act. Sqn. Ldr. E. C. Brighouse, R.A.F.V.R., No. 356 Sqn.
Act. Sqn. Ldr. E. James, R.A.F.V.R., No. 107 Sqn.
Act. Sqn. Ldr. S. J. Pollock, R.A.F.V.R., No. 292 Sqn.
P/O. F. Day, R.A.F., No. 158 Sqn.
P/O. A. J. Dick, D.F.M., R.A.F.V.R., No. 35 Sqn.
P/O. H. W. Gould, R.A.F.V.R., No. 51 Sqn.
P/O. L. C. Griffiths, R.A.F.V.R., No. 9 Sqn.
P/O. H. S. MacLean, R.A.F.V.R., No. 426 (R.C.A.F.) Sqn.
P/O. G. McCutcheon, R.A.F.V.R., No. 158 Sqn.
P/O. R. H. Mason, R.A.F.V.R., No. 10 Sqn.
P/O. R. G Musgrave, D.F.M., R.A.F., No. 7 Sqn.
P/O. A. E. Parker, R.A.F.V.R., No. 49 Sqn.
P/O. J. Reynolds, R.A.F.V.R., No. 10 Sqn.
P/O. G. W. Rowland, R.A.F.V.R., No. 433 (R.C.A.F.) Sqn.
P/O. W. E. A. Salter, R.A.F.V.R., No. 49 Sqn.
P/O. R. D. Searle, D.F.M., R.A.F.V.R., No. 7 Sqn.
P/O. G. A. W. Stubbing, R.A.F.V.R., No. 15 Sqn.
F/O. P. B. Thompson, D.F.M., R.A.F.V.R., No. 582 Sqn.
W/O. A. H. Beaton, D.F.M., R.A.F.V.R., No. 7 Sqn.
W/O. H. Ellis, R.A.F.V.R., No. 83 Sqn.
W/O. S. D. Hargreaves, R.A.F.V.R., No. 83 Sqn.
W/O. E. G. Nisbett, R.A.F.V.R., No. 619 Sqn.
W/O. W. H. Pengelly, R.A.F.V.R., No. 617 Sqn.
W/O. B. F. Shearwood, R.A.F.V.R., No. 97 Sqn.
Act. W/O. J. E. Lumb, R.A.F.V.R., No. 156 Sqn.
F/O. A. A. W. Lobton, R.A.F.V.R., No. 61 Sqn.
F/O. J. McCulloch, R.A.F.V.R., No. 105 Sqn.
F/O. J. K. Macdonald, R.A.F.V.R., No. 582 Sqn.
F/O. L. W. C. Maidment, R.A.F.V.R., No. 192 Sqn.
F/O. G. H. Markes, R.A.F.V.R., No. 150 Sqn.
F/O. J. L. Martin, R.A.F.V.R., No. 460 (R.A.A.F.) Sqn.
F/O. J. Y. Murray, R.A.F.V.R., No. 608 Sqn.
F/O. K. Ovenden, R.A.F.V.R., No. 115 Sqn.
F/O. R. Packer, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
F/O. E. W. Parker, R.A.F.V.R., No. 626 Sqn.
F/O. W. S. Parker (since deceased), R.A.F.V.R., No. 195 Sqn.
F/O. A. J. L. Ridge, R.A.F.V.R., No. 576 Sqn.
F/O. E. J. Rosling, R.A.F.V.R., No. 514 Sqn.
F/O. E. A. B. Sanford, R.A.F.V.R., No. 467 Sqn.
F/O. J. D. Smith, R.A.F.V.R., No. 7 Sqn.
F/O. R. E. Smith, R.A.F.V.R., No. 141 Sqn.
F/O. G. Stenhouse, R.A.F.V.R., No. 207 Sqn.
F/O. W. E. Stone, R.A.F.V.R., No. 7 Sqn.
F/O. P. A. S. Twinn, R.A.F.V.R., No. 149 Sqn.
F/O. L. A. Titmuss, R.A.F.V.R., No. 626 Sqn.
F/O. A. D. Vockins, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
F/O. B. S. H. Wadham, R.A.F.V.R., No. 7 Sqn.
F/O. B. L. G. Weaving, R.A.F., No. 214 Sqn.
F/O. W. J. Wells, R.A.F.V.R., No. 207 Sqn.
F/O. A. G. W. Winch, R.A.F., No. 635 Sqn.
F/O. A. E. Wood, R.A.F.V.R., No. 199 Sqn.
F/O. A. R. Wray, R.A.F.V.R.
F/O. A. Yeomans, R.A.F.V.R., No. 102 Sqn.
F/O. E. P. Youngs, R.A.F.V.R., No. 223 Sqn.
Act. F/O. L. E. Smith, R.A.F.V.R., No. 77 Sqn.
P/O. W. Armstrong, R.A.F., No. 578 Sqn.
P/O. J. H. Badcock, R.A.F.V.R., No. 158 Sqn.
P/O. A. Bairstow, R.A.F.V.R., No. 77 Sqn.
P/O. B. S. Beecroft, R.A.F.V.R., No. 223 Sqn.
P/O. J. Blakey, R.A.F.V.R., No. 460 (R.A.A.F.) Sqn.
P/O. W. C. Bridgford, R.A.F.V.R., No. 109 Sqn.
P/O. H. Brown, R.A.F.V.R., No. 100 Sqn.
P/O. S. Carpenter, R.A.F.V.R., No. 156 Sqn.
P/O. S. J. Carthy (since deceased), R.A.F.V.R., No. 466 (R.A.A.F.) Sqn.
P/O. A. R. Chandlee, R.A.F.V.R., No. 635 Sqn.
P/O. J. F. Macmillan, R.A.A.F. No. 57 Sqn.
F/O. R. A. Hollowell, R.C.A.F., No. 626 Sqn.
Flt. Lt. D. J. Reid, R.A.A.F., No. 41 Sqn.
Act. Flt. Lt. I. G. Durston, R.A.A.F., No. 467 (R.A.A.F.) Sqn.
Act. Flt. Lt. F. C. W. Healey, R.A.A.F., No. 156 Sqn.
F/O. G. W. Nunn, R.A.A.F., No. 464 (R.A.A.F.) Sqn.
F/O. H. L. Mitchell, R.A.A.F., No. 464 (R.A.A.F. Sqn.
F/O. V. L. Turner, R.A.A.F., No. 56 Sqn.



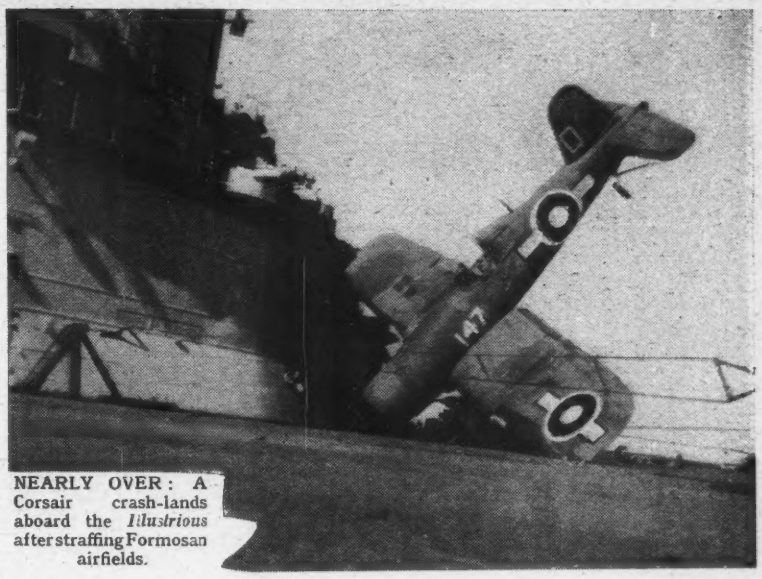
ORDERS OF THE DAY: German prisoners are employed by the R.A.F. in Norway in collecting German aircraft and munitions left over after the German surrender. Wing Cdr. Russel, c/o of a Disarmament Wing, is seen giving his orders, through an interpreter, to the oberleutnant responsible for the prisoners' discipline.

SERVICE

Act. Flt. Lt. R. R. Dixon, R.A.F.V.R., No 10 Sqn.
Act. Flt. Lt. T. P. McGarry, R.A.F.V.R., No. 35 Sqn.
Act. Flt. Lt. W. G. Ross, D.F.M., R.A.F.V.R., No. 83 Sqn.
Act. Flt. Lt. P. A. Thomas, R.A.F.V.R., No. 582 Sqn. (since deceased).
F/O. J. C. Atkinson, R.A.F.V.R., No. 49 Sqn.
Flt. Lt. J. R. Northrup, R.C.A.F., No. 415 (R.C.A.F.) Sqn.
Flt. Lt. W. R. Oatway, R.C.A.F., No. 424 (R.C.A.F.) Sqn.
Flt. Lt. F. C Shortts, R.C.A.F., No. 35 Sqn.
Flt. Lt. J. E. Sisman, R.C.A.F., No 431 (R.C.A.F.) Sqn.
Flt. Lt. R. A. Spencler, R.C.A.F., No. 405 (R.C.A.F.) Sqn.
Flt. Lt. S. J. Walker, R.C.A.F., No. 432 (R.C.A.F.) Sqn.
Act. Flt. Lt. W. M. Bateman, R.C.A.F., No. 76 Sqn.
Act. Flt. Lt. G. J. Brownell, R.C.A.F., No. 582 Sqn.
Act. Flt. Lt. W. R. Chalcraft, R.C.A.F., No. 419 (R.C.A.F.) Sqn.
Act. Flt. Lt. L. I. Kagna, R.C.A.F., No. 426 (R.C.A.F.) Sqn.
Act. Flt. Lt. W C. Martin, R.C.A.F., No. 166 Sqn.
Act. Flt. Lt D. F. McGrath, R.C.A.F., No. 433 (R.C.A.F.) Sqn.
Act. Flt. Lt. L. E. Munro, R.C.A.F., No. 156 Sqn.
Act. Flt. Lt. H. G. Thomson, R.C.A.F., No. 432 (R.C.A.F.) Sqn.
Act. Flt. Lt. T. C. Wagar, R.C.A.F., No. 427 (R.C.A.F.) Sqn.
F/O. J. R. Angus, R.C.A.F., No. 426 (R.C.A.F.) Sqn.
F/O. T. V. Barber, R.C.A.F., No. 408 (R.C.A.F.) Sqn.
F/O. A. R. B. Barrett, R.C.A.F., No. 424 (R.C.A.F.) Sqn.
F/O. D. W. J. Beckley, R.C.A.F., No. 405 (R.C.A.F.) Sqn.
F/O. G. W. Bell, R.C.A.F., No. 550 Sqn.
F/O. W. J. Bigelow, R.C.A.F., No. 434 (R.C.A.F.) Sqn.
F/O. R. J. T. Bourque, R.C.A.F., No. 429 (R.C.A.F.) Sqn.
W/O. M. J. Bagan, R.A.F.V.R., No. 15 Sqn.
W/O. J. H. Brown, R.A.F.V.R., No. 15 Sqn.
W/O. R. W. Fenwick, R.A.F.V.R., No. 627 Sqn.
W/O W C. Harrison, R.A.F.V.R., No. 153 Sqn.
W/O. E. Kerkin, R.A.F.V.R., No. 582 Sqn.
W/O. D. Lowe, R.A.F.V.R., No. 15 Sqn.
W/O. H. McLellan, R.A.F.V.R., No. 582 Sqn.
W/O. A. J. Mitchell, R.A.F.V.R., No. 214 Sqn.
W/O. J. C. Moss, R.A.F.V.R., No. 7 Sqn.
W/O. D. A. Moverley, R.A.F.V.R., No. 186 Sqn.
W/O. K. Page, R.A.F.V.R., No. 635 Sqn.
W/O. M. Palmer, R.A.F.V.R., No. 35 Sqn.
W/O. G. B. Stratford, R.A.F., No. 514 Sqn.
W/O. C. J. Taylor, R.A.F.V.R., No. 35 Sqn.
W/O. F. V. Thomas, R.A.F.V.R., No. 35 Sqn.
W/O. S. R. Warsop, R.A.F.V.R., No. 57 Sqn.
W/O. K. N. Webb, R.A.F.V.R., No. 582 Sqn.
Act. W/O. A. E. Scott, R.A.F.V.R., No. 582 Sqn.
Act. Sq. Ldr. E. F. Sall, R.A.F.O., No. 180 Sqn.
Flt. Lt. G. Brennan, R.A.F.V.R., No. 159 Sqn.
Flt. Lt. D. M. Finn, R.A.F.V.R., No. 4 (R.I.A.F.) Sqn.
Flt. Lt. J. L. Goldby, R.A.F.V.R., No. 640 Sqn.
Flt Lt. R. F. Noble, R.A.F.V.R., No. 607 Sqn.
Flt. Lt. W. G. Owen, R.A.F.V.R., No. 48 Sqn.
Flt. Lt. R. Parsons, R.A.F.V.R., No. 226 Sqn.
Flt. Lt. A. J. A. Sherrott, R.A.F.V.R., No. 355 Sqn.
Flt. Lt. E. J. V. Thomas, R.A.F.V.R., No. 604 Sqn.
Flt Lt. B. Williams, R.A.F.V.R., No. 605 Sqn.
Act. Flt. Lt. D. K. Brown, R.A.F.V.R., No. 355 Sqn.
Act. Flt. Lt. P. Duffield, R.A.F.V.R., No. 354 Sqn.
Act. Flt. Lt. E. K. P. Ince, R.A.F.V.R., No. 1 Wing, G.P.R.
Act. Flt. Lt. J. E. W. Lodge, R.A.F.V.R., No. 1 Wing, G.P.R.
F/O. G. Atkinson, R.A.F.V.R., No. 1 Wing, G.P.R.
F/O. S. Barnard, R.A.F.V.R., No. 613 Sqn.
F/O R. Ellis, R.A.F.V.R., No. 107 Sqn.
F/O. W. B M. Hunter, R.A.F.V.R., No. 680 Sqn.
F/O. J. H. P. Kitt, R.A.F.V.R., No. 292 Sqn.
F/O. J. T. Love, R.A.F.V.R., No. 1 Wing, G.P.R.
F/O. G. F. Norton, R.A.F.V.R., No. 88 Sqn.
F/O. M. J. Odlum, R.A.F.V.R., No. 1 Wing, G.P.R.
F/O. R. Perfect, R.A.F.V.R., No. 488 (N.Z.) Sqn.
F/O. G. E. Pinder, R.A.F.V.R., No. 159 Sqn.
F/O. F. Sayer, R.A.F.V.R., No. 21 Sqn.
F/O. E. R. Williams, R.A.F.V.R., No. 88 Sqn.
F/O. E. H. Woodhouse, R.A.F.V.R., No. 65 Sqn.
P/O. P. R. Rose, R.A.F.V.R., No. 604 Sqn.
W/O. S. E. Hardy, R.A.F.V.R., No. 605 Sqn.
Flt. Lt. R. C. Reichel, R.C.A.F., No. 88 Sqn.
Flt. Lt. R. N. Rivers, R.C.A.F., No. 409 (R.C.A.F.) Sqn.
Flt. Lt. W. R. Tew, R.C.A.F., No. 401 (R.C.A.F.) Sqn.
Act. Flt. Lt. L. Woloschuk, R.C.A.F., No. 414 (R.C.A.F.) Sqn.
F/O. F. W. Evans, R.C.A.F., No. 421 (R.C.A.F.) Sqn.
F/O. J. P. W. Francis, R.C.A.F., No. 401 (R.C.A.F.) Sqn.
F/O. R. A. Urquhart, R.C.A.F., No. 50 Sqn.
P/O. E. A. Foster, R.C.A.F., No. 115 Sqn.

IATION

P/O. H. MINNIS, R.C.A.F., No. 115 Sqn.
F/O. B. N. SURENDRA, R.I.A.F., No. 4 (R.I.A.F.) Sqn.
F/O. A. R. EVANS, R.N.Z.A.F., No. 486 (R.N.Z.A.F.) Sqn.
F/O. B. J. O'CONNOR, R.N.Z.A.F., No. 436 Sqn.
W/O. R. CULLUM, R.N.Z.A.F., No. 487 (R.N.Z.A.F.) Sqn.
Maj. R. A. HENWICK, S.A.A.F., No. 80 Sqn.
Capt. J. C. COETZEE, S.A.A.F., No. 5 (S.A.A.F.) Sqn.
Lt. H. P. ANDERSON, S.A.A.F., No. 93 Sqn.
Act. Sqn. Ldr. G. G. A. DAVIES, R.A.F.O., No. 607 Sqn.
F/O. S. J. RAND, R.A.F.V.R., No. 117 Sqn.
W/O. J. D. MCCREDIE, R.A.A.F., No. 99 Sqn.
W/O. M. H. PATTERSON, R.A.A.F., No. 117 Sqn.
Wing Cdr. J. N. YOUNG, R.A.F., No. 78 Sqn.
Act. Sqn. Ldr. W. C. BRODIE, D.S.O., D.F.M., R.A.F., No. 692 Sqn.
Act. Sqn. Ldr. H. L. CREETH, R.A.F.V.R., No. 83 Sqn.
Act. Sqn. Ldr. I. G. FADDEN, B.E.M., R.A.F.V.R., No. 61 Sqn.
Act. Sqn. Ldr. P. A. C. MCDERMOTT, D.F.M., R.A.F.V.R., No. 162 Sqn.
Flt. Lt. T. E. BEAMAN, R.A.F.V.R., No. 10 Sqn.
Flt. Lt. D. S. CHECKLIN, R.A.F.V.R., No. 158 Sqn.
Flt. Lt. P. M. P. CRAMPTON, D.F.M., R.A.F.V.R., No. 61 Sqn.
Flt. Lt. L. D. EASTERMAN, R.A.F.V.R., No. 195 Sqn.
Flt. Lt. A. G. FARTHING, R.A.F.V.R., No. 617 Sqn.
Flt. Lt. R. G. C. FOLLIS, R.A.F.V.R., No. 239 Sqn.
Flt. Lt. R. J. HORTON, D.F.M., R.A.F.V.R., No. 640 Sqn.
Flt. Lt. O. LLOYD DAVIES, R.A.F.V.R., No. 100 Sqn.
Flt. Lt. A. P. MOUNTAIN, D.F.M., R.A.F.V.R., No. 109 Sqn.
Flt. Lt. E. POVEY, D.F.M., R.A.F.V.R., No. 105 Sqn.
Act. Flt. Lt. E. ANSLOW, R.A.F., No. 115 Sqn.
Act. Flt. Lt. D. T. BONE, D.F.M., R.A.F.V.R., No. 15 Sqn.
Act. Flt. Lt. S. G. BURTON, D.F.M., R.A.F.V.R., No. 170 Sqn.
Act. Flt. Lt. J. A. FLETCHER, R.A.F.V.R., No. 158 Sqn.
Act. Flt. Lt. F. W. A. HENDRY, R.A.F.V.R., No. 97 Sqn.
Act. Flt. Lt. J. MACKAY, D.F.M., R.A.F.V.R., No. 429 (R.C.A.F.) Sqn.
Act. Flt. Lt. I. H. NICOLSON, D.F.M., R.A.F.V.R., No. 105 Sqn.
F/O. N. BARTLETT, R.A.F., No. 75 (N.Z.) Sqn.
F/O. H. E. BOULTER, R.A.F.V.R., No. 163 Sqn.
F/O. H. P. CRUMPLIN, D.F.M., R.A.F.V.R., No. 163 Sqn.
F/O. J. H. DONOGHUE, R.A.F.V.R., No. 171 Sqn.
F/O. R. W. FIRMIN, R.A.F.V.R., No. 50 Sqn.
Wing Cdr. J. M. FORMAN, R.C.A.F., No. 428 (R.C.A.F.) Sqn.
Act. Wing Cdr. F. S. MCCARTHY, R.C.A.F., No. 420 (R.C.A.F.) Sqn.
Flt. Lt. L. O. WILLIAMS, A.F.C., R.A.A.F., No. 550 Sqn.
Act. Flt. Lt. C. N. HALPIN, R.A.A.F., No. 466 (R.A.A.F.) Sqn.
Act. Flt. Lt. G. F. KLENNER, R.A.A.F., No. 218 Sqn.
Act. Flt. Lt. F. W. LEE, R.A.A.F., No. 466 (R.A.A.F.) Sqn.
Act. Flt. Lt. E. H. LUDER, R.A.A.F., No. 550 Sqn.
Act. Flt. Lt. J. F. PRICE, R.A.A.F., No. 83 Sqn.
Act. Flt. Lt. H. F. ROBERTS, R.A.A.F., No. 97 Sqn.
Act. Flt. Lt. J. T. ROBSON, R.A.A.F., No. 115 Sqn.
F/O. C. E. CAMPBELL, R.A.A.F., No. 466 (R.A.A.F.) Sqn.
Maj. J. L. VAN EYSSEN, S.A.A.F., No. 31 (S.A.A.F.) Sqn.
Flt. Lt. A. J. A. BRYAN, R.C.A.F., No. 417 (R.C.A.F.) Sqn.
Capt. N. V. COATS, S.A.A.F., No. 31 (S.A.A.F.) Sqn.
Capt. E. L. GARSON, S.A.A.F., No. 30 (S.A.A.F.) Sqn.
Capt. H. P. WILES, S.A.A.F., No. 2 (S.A.A.F.) Sqn.
Lt. W. A. DOWDEN, S.A.A.F., No. 1 (S.A.A.F.) Sqn.
Lt. R. E. DE JONGH, S.A.A.F., No. 1 (S.A.A.F.) Sqn.
Act. Sqn. Ldr. T. P. O'BRIEN, R.A.F.V.R., No. 357 Sqn.
W/O. J. J. CARDUTT, R.A.F.V.R., No. 240 Sqn.
Flt. Lt. P. E. ETIENNE, R.C.A.F., No. 406 (R.C.A.F.) Sqn.
Flt. Lt. W. A. BOAK, R.C.A.F., No. 406 (R.C.A.F.) Sqn.
Flt. Lt. F. M. JARMAN, R.A.A.F., No. 161 Sqn.
Flt. Lt. V. G. SHAIL, R.C.A.F., No. 405 (R.C.A.F.) Sqn.
Flt. Lt. M. J. STANLEY, R.A.F.V.R., No. 11 Group.
Flt. Lt. W. K. SHRIMPTON, R.A.A.F., No. 464 (R.A.A.F.) Sqn.
F/O. F. F. EDWARDS, R.A.A.F., No. 130 Sqn.
F/O. P. R. LAKE, R.A.A.F., No. 464 (R.A.A.F.) Sqn.
P/O. J. A. BOULTON, R.A.A.F., No. 130 Sqn.
Act. Sqn. Ldr. A. S. COLLINS, R.C.A.F., No. 400 (R.C.A.F.) Sqn.
Flt. Lt. W. T. BEAKENEY, R.C.A.F., No. 414 (R.C.A.F.) Sqn.



NEARLY OVER: A Corsair crash-lands aboard the *Illustrious* after straffing Formosan airfields.

Flt. Lt. H. R. FINLEY, R.C.A.F., No. 443 Sqn.
Flt. Lt. L. FOSTER, R.C.A.F., No. 403 Sqn.
Flt. Lt. S. D. MARLATT, R.C.A.F., No. 439 (R.C.A.F.) Sqn.
Flt. G. L. STARKEY, R.C.A.F., No. 33 Sqn.
Flt. Lt. W. N. STOWE, R.C.A.F., No. 130 Sqn.
Act. Flt. Lt. W. M. MIDDLETON, R.C.A.F., No. 430 (R.C.A.F.) Sqn.
Act. Sqn. Ldr. R. J. DEMPSEY, R.N.Z.A.F., No. 487 (N.Z.) Sqn.
Flt. Lt. H. W. LONGLEY, R.N.Z.A.F., No. 3 Sqn.
Flt. Lt. L. M. RALPH, R.N.Z.A.F., No. 66 Sqn.
Act Flt Lt. F. B. LAWLESS, R.N.Z.A.F., No. 198 Sqn.
F/O. R. D. HARKNESS, R.N.Z.A.F., No. 609 Sqn.
W/O. B. W. WOODMAN, R.N.Z.A.F., No. 130 Sqn.
Capt. L. P. T. EAGAR, S.A.A.F., No. 164 Sqn.
Wing Cdr. H. F. WOOD, R.A.F.O., No. 226 Sqn.
Sqn. Ldr. H. S. HALES, R.A.F.V.R., No. 93 Sqn.
Act. Sqn. Ldr. D. W. B. FARRAR, R.A.F.V.R., No. 219 Sqn.
Flt. Lt. G. BELLERBY, R.A.F.V.R., No 16 Sqn.
Flt. Lt. P. COWELL, R.A.F.V.R., No. 41 Sqn.
Flt. Lt. J. DABER, R.A.F.V.R., No. 264 Sqn.
Flt. Lt. L. Y. J. FRIEND, R.A.F., No. 80 Sqn.
Flt. Lt. A. G. HUMPHRYES, R.A.F.V.R., No. 140 Sqn.
Flt. Lt. R. S. W. KEMP, R.A.F., No. 2 Sqn.
Flt. Lt. G. H. LEES, R.A.F.V.R.
Flt. Lt. G. A. RICHMOND, R.A.F.V.R., No. 140 Sqn.
Flt. Lt. R. D. ROBERTSON, R.A.F., No. 226 Sqn.
Flt. Lt. N. W. WALKER, R.A.F.V.R., No 3 Sqn.
Flt. Lt. R. D. WALTEN, R.A.F.V.R., No 140 Sqn.
F/O. F. J. T. BROOKS, D.F.M., R.A.F., No. 170 Sqn.
F/O. G. A. BUSH, R.A.F.V.R., No. 80 Sqn.
F/O. E. M. L. DENNEY, R.A.F.V.R., No. 183 Sqn.
F/O. R. G. HAMPSON, R.A.F.V.R., No. 226 Sqn.
F/O. G. LORD, R.A.F.V.R., No. 139 Sqn.
F/O. D. E. MATTHEWS, R.A.F.V.R, No. 197 Sqn.
F/O. J. C. ROOK, R.A.F.V.R., No. 197 Sqn.
F/O. M. SCOTT, R.A.F.V.R., No. 180 Sqn.
P/O. P. T. COLEMAN, R.A.F.V.R., No. 41 Sqn
P/O. W. HARPER, R.A.F.V.R., No. 140 Sqn.
P/O. E. HUGHES, R.A.F.V.R., No. 245 Sqn.
P/O. D. J. WATKINS, R.A.F.V.R., No. 350 Sqn
W/O. W. BURNS, R.A.F.V.R., No. 98 Sqn.
W/O. C. DOBSON, R.A.F.V.R., No. 21 Sqn.
W/O. J. A. HEATHCOTE, R.A.F.V.R., No. 264 Sqn
W/O. I. T. STEVENSON, R.A.F.V.R., No. 41 Sqn.
F/O. R. A. FORBES, R.C.A.F., No. 435 (R.C.A.F.) Sqn.
F/O. C. D. FRENCH, R.C.A.F., No 424 (R.C.A.F.) Sqn.
F/O. C. A. GEORGE, R.C.A.F., No. 192 Sqn.
F/O. E. C. GILFIN, R.C.A.F. No. 433 (R.C.A.F.) Sqn.
F/O. F. GLANDING, R.C.A.F., No. 405 (R.C.A.F.) Sqn.
F/O. J. C. R. GRAN, R.C.A.F., No. 9 Sqn
F/O. G. H. GRAY, R.C.A.F., No 405 (R.C.A.F.) Sqn.
F/O. M. W GUINN, R.C.A.F., No 408 (R.C.A.F.) Sqn.
F/O. G. A. HARPWOOD, R.C.A.F., No 408 (R.C.A.F.) Sqn.
F/O. K. R. HICKMOTT, R.C.A.F., No. 619 Sqn.
F/O. J. F. HINDLE, R.C.A.F., No. 419 (R.C.A.F.) Sqn.
F/O. A. W. HUTCHINS, R.C.A.F., No. 426 (R.C.A.F.) Sqn
F/O. W. B. HYNDMAN, R.C.A.F., No. 158 Sqn.
F/O. R. V. JAMES, R.C.A.F., No 429 (R.C.A.F.) Sqn.
F/O L. H. KEMP, R.C.A.F., No. 158 Sqn.
F/O. D. G. KERR, R.C.A.F., No. 76 Sqn.
F/O. A. KUPERMAN, R.C.A.F., No. 158 Sqn.
F/O. M. V. LAWRENCE, R.C.A.F., No. 158 Sqn.
F/O E. G. LEGRICE, R.C.A.F., No. 415 (R.C.A.F.) Sqn.
F/O. J. B. LINDSAY, R.C.A.F., No. 405 (R.C.A.F.) Sqn.
F/O. S. MACDONALD, R.C.A.F., No. 428 (R.C.A.F.) Sqn.
F/O. A. F. MCDOWELL, R.C.A.F., No. 424 (R.C.A.F.) Sqn.
F/O. D. C. MCGAVIN, R.C.A.F., No. 434 (R.C.A.F.) Sqn.
F/O. J. J. MCINTYRE, R.C.A.F., No. 78 Sqn.
F/O. J. H. MCKAY, R.C.A.F., No. 419 (R.C.A.F.) Sqn.
F/O. J. MEEK, R.C.A.F., No. 150 Sqn.
F/O. V. L. MILLS, R.C.A.F., No. 76 Sqn.
F/O. D. MILTON, R.C.A.F., No. 77 Sqn.
F/O. W. E. C. MORRIS, R.C.A.F., No. 415 (R.C.A.F.) Sqn.
F/O. E. A. MOWATT, R.C.A.F., No. 408 (R.C.A.F.) Sqn.
F/O. F. B. MURPHY, R.C.A.F., No. 434 (R.C.A.F.) Sqn.
F/O. H. E. NAUGLER, R.C.A.F., No. 101 Sqn.
F/O. C. I. H. NICHOLL, R.C.A.F., No. 514 Sqn
F/O. L. P. OGLE, R.C.A.F., No. 153 Sqn.
F/O. J. C. PARRY, R.C.A.F., No 166 Sqn
F/O. J. C. PATTERSON, R.C.A.F., No. 77 Sqn.
F/O. A. B PAUL, R.C.A.F., No. 429 (R.C.A.F.) Sqn.
F/O. H. C. PEGG, R.C.A.F., No. 429 (R.C.A.F.) Sqn.
F/O. E. R. PENNER, R.C.A.F., No. 424 (R.C.A.F.) Sqn.
F/O. I. D. REID, R.C.A.F., No. 433 (R.C.A.F.) Sqn.
F/O. W. R. REID, R.C.A.F., No. 427 (R.C.A.F.) Sqn.
F/O. J. V. REYNOLDS, R.C.A.F., No. 78 Sqn
F/O. R. C. RICHEY, R.C.A.F., No 428 (R.C.A.F.) Sqn.
F/O R. K. ROSEBURGH, R.C.A.F., No 428 (R.C.A.F.) Sqn
F/O. K. C. ROULSTON, R.C.A.F., No. 428 (R.C.A.F.) Sqn

(Left) Badge of No. 830 Sqn., Naval Air Arm. No motto. On a field per fesse wavy blue and barry wavy of 6 white and blue, a sword erect point downward, proper winged gold surmounted by a Maltese Cross white. (Right) Badge of No. 841 Sqn., Naval Air Arm, "Lucemus Nocte" (We shine by night). On a blue field a barn owl afrontee white, perched upon a beam, also white.

F/O. H. RUBIN, R.C.A.F., No. 434 (R.C.A.F.) Sqn.
F/O F. C. SAMUELS, R.C.A.F., No. 158 Sqn.
F/O. R. F. SAUNDERS, R.C.A.F., No. 433 (R.C.A.F.) Sqn.
F/O. R. C SEALE, R.C.A.F., No. 429 (R.C.A.F.) Sqn.
F/O. J. W. SINGER, R.C.A.F., No. 9 Sqn.
F/O. R. B. STEWART, R.C.A.F., No. 408 (R.C.A.F.) Sqn.
F/O. R. D. THAUVETTE, R.C.A.F., No. 415 (R.C.A.F.) Sqn.
F/O. H. E. THORNICROFT, R.C.A.F., No. 427 (R.C.A.F.) Sqn.
F/O. R. J. TIERNEY, R.C.A.F., No. 626 Sqn.
F/O. W. A. TULLOCH, R.C.A.F., No. 162 Sqn.
F/O. B. C. WALLACE, R.C.A.F., No. 408 (R.C.A.F.) Sqn.

Distinguished Flying Medal

Flt. Sgt. A. E. SELLARS, R.A.F.V.R., No. 240 Sqn.—(For citation see F/O. Ridgway, D.S.O.)
Flt. Sgt. R. B. FARMILOE, R.A.F.V.R., No. 197 Sqn.
Flt. Sgt. J. SMITH, R.A.F.V.R., No. 69 Sqn.
Flt. Sgt. J. K. SPEDDING, R.A.F.V.R., No. 35 Sqn.
L.A/C. C. W. J. WATTS, R.A.F.V.R., No. 658 Sqn.
Flt. Sgt. A. J. HORNE, R.C.A.F., No. 424 (R.C.A.F.) Sqn.
Flt. Sgt. E. E. R. KERR, R.C.A.F., No. 162 (R.C.A.F.) Sqn.
Flt. Sgt. P. J. MCNULTY, R.A.F., No. 356 Sqn.
Flt. Sgt. J. F. BROWN, R.A.A.F., No. 142 Sqn.
Flt. Sgt. J. L. CRADDOCK, R.A.A.F., No. 142 Sqn.
Flt. Sgt. L. A. HARRIS, R.A.A.F., No. 142 Sqn.
Flt. Sgt. E. H. KITSON, R.A.F.V.R., No. 240 Sqn.
Flt. Sgt. W. M. MONKMAN, R.A.F.V.R., No. 249 Sqn.
Flt. Sgt. J. BARKER, R.A.F.V.R., No. 172 Sqn.
Flt. Sgt. B. C. S. DADSWELL, R.A.F.V.R., No. 612 Sqn.
Flt. Sgt. D. FOWLER, R.A.F.V.R., No. 210 Sqn.

THE KING has been graciously pleased to approve the following awards:—

George Medal

W/O. A. A. R. MCGARVEY, R.A.F.V.R.

O.B.E. (Mil.)

F/O. G. O. CARTER, R.A.F.V.R.

B.E.M. (Mil.)

L.A/C. F. SPEDDING, R.A.F.V.R.
A/C.1 J MACLEAN, R.A.F.V.R.
Sgt. L. V. JAMES, R.A.F.V.R.
L.A/C. R. H. DANN, R.A.F.V.R.
Naik H. JAN, R.I.A.F.
Havildar H. MOHD, R.I.A.F.

Roll of Honour

Casualty Communiqué No. 534.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

Of the names in this list, 200 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—P/O. D. M. Cooke; Sgt. R. L. Dinnen.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. R. A. Barrett; F/O. H. G. Benson; Sgt. R. Bramley; Act. Sqn. Ldr. E. N. Bunting, D.F.C.; Sgt. K. S. Clelland; Sgt. R. H. Cozens; Flt. Sgt. D. J. Fitzgerald; Flt. Sgt. R. C. Fitzgerald; Flt. Lt. S. J. Houlden; Sgt. W. R. Melling; F/O. E. Spedding; Sgt. L. T. V. Sutfield; W/O. F. Warner; P/O. R. Welch; Flt. Lt. C. A. Whyatt; Sgt. A. R. Williams.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—F/O. L. H. Abbott; Flt. Lt. A. W. Adams; Sgt. F. I. Anderson; Sgt. N. McC. Anderson; Sgt. H. F. Benbow; Sgt. R. J. Boyce; Sgt. H. Bradley; Flt. Lt. F. M. Burton; Flt. Sgt. F. A. J. Button; Sgt. W. D. Cairns; Sgt. J. Casey; Sgt. J. E. Caton; F/O. B. A. Clack; F/O. F. W. Clare; P/O. R. L. Clenahan; Flt. Sgt. R. S. Cole; Flt. Sgt. G. E. Creer; F/O. A. D. Crit hlow; Sgt. G. P. Croad; Flt. Lt. R. J. Curtis, D.F.M.; Flt. Sgts. G. H. Davies; Sgt. E. C. Day; Sgt. M. Des; P/O. D. R. Dearman; P/O. J. R. Dickinson; Sgt. H. Dootson; P/O. R. Earnshaw; F/O. K. K. Edwards; Sgt. J. Ellenor; Sgt. H. K. Feltham; Sgt. S. F. Foster; Flt. Sgt. C. V Fox; F/O. R. Frazer; P/O. C. A. Frost; Sgt. W. J. Goodyear; Sgt. F. C. Gore; Flt. Sgt. B. G. Green; Sgt. R. B. Hainsworth; Flt. Sgt. F. Hartley; Sgt. A. G. Haywood; Sgt. C. A. Hensey; P/O. S. Hewitt; Flt. Sgt. J. Heyes; Sgt. F. W. Hinton; Sgt. J. G. Hodge; Flt. Sgt. F. N. Holmes; Sgt. R. H. Hudson, D.F.M.; Flt. Sgt. J. R. Ingham; Sgt. L. G. A. Izod; Flt. Sgt. J. D. S. James; F/O. E. Jones; Flt. Sgt. M. Kieff; Flt. Sgt. R. J. Larner; P/O G. Lassey; Sgt. F. M. Leaney; Act. Sqn. Ldr. R. H. P. Lee-Warner, A.F.C.; F/O. K. M. Liddle; Sgt. A. R. Line; Sgt. D. E. Lister; Sgt. T. K. D. Lucas; Flt. Sgt. W. Mabon; Sgt. J. A. A. Mansfield; Sgt. S. F. Martin; Sgt. S. Mason; Flt. Sgt. S. I. Miller; P/O. R. Montgomery; Sgt. J. Nicholl; Sgt. J. Palfrey; Sgt. T. Parkin; Sgt. R. L. M. Peirce; Sgt. S. J. W. Poulson; Sgt. W. A. Pullen; Flt. Sgt. L. P. Quinn; Sgt. L. G. Reilly; Sgt. J. Robinson; Sgt. R. C. Robinson; P/O. A. G. Scott; Sgt. J. Sheffield; Sgt. E. F. Sherwin; Flt. Sgt. D. E. Simmons; Sgt. C. W. F. Sizer; Sgt. D. J. Skeites; Flt. Sgt. S. Smith; Sgt. N. D. Staff; Sgt. W. Stovold; P/O. R. N. Taft; Sgt. P. D. Taylor; Act. Flt. Lt. G. A. Thatcher; Sgt. G. H. Tyler; P/O. W. N. Wait; Flt. Sgt. F. W. Wale; Sgt. B. H. Watts; Sgt. R. Williams; Sgt. F. C. Willis; Flt. Sgt. R. A. Willis; Sgt. J. Wilson.

MISSING, BELIEVED KILLED IN ACTION.—Sgt D. H. Henson; Flt. Sgt. D. A. Smith.

MISSING.—Act. Flt. Lt. F. J. Abbott; Flt. Sgt W. Ashford; Flt. Sgt. T. Ashworth; Sgt. R. Beales; Flt. Sgt. R. P. Belshaw; P/O. A. J. Bezant; Flt. Sgt. V. H. Binch; Sgt. R. Black; P/O. C. W. Bowers; W/O. E. Boydell; Flt. Sgt. R. W. Brett; Flt. Sgt. A. Burns; Flt. Sgt. G. B. Burns; Flt. Sgt. J. F. Charlton; Flt. Lt. A. Crabtree; Flt. Sgt. G. Cross; Flt. Sgt. D. D. Duckworth; Flt Sgt. J. Duncan; Sgt. J. Faulkner; Sqn. Ldr. R. G. R. Frazer; Flt. Sgt. W. J. Goodbody; F/O. G. V. Goodes, D.F.M.; F/O. V. M. Grant; W/O. R. W. Hainsworth, D.F.M.; Sgt. F. M. Harvey; P/O. H. Henderson; Sgt. N. Hicks; P/O. L. G. Holland, D.F.M.; Sgt. W. L. James; Flt. Sgt. M. Jones; Flt. Sgt. T. Kelly; Sgt. R. Kerr; Flt. Sgt. J. Levey; Flt. Sgt. J. E. Lomas; W/O. D. S. McGregor, D.F.M.; F/O. J. V. McShane; Sgt. C. S. Mason; Sgt. W. E. May; Sgt. J. S. Mohun; Sgt. P. R. Montgomery; F/O D. V. Myers; Sgt. D. O'Sullivan; F/O. G. H. Paley; Flt. Lt. A. F. W. Polden; Flt. Sgt. R. Potter; Sgt. E. L. Preece; W/O. J. D. R. Pugsley; W/O. V. A. Roe, D.F.M.; Flt. Sgt. J. P. Rowan; F/O. S. O. Scott; Sgt. R. Scrowther; Sgt. T. Slater; Act. Flt. Lt. K. S. Smith; Sgt. A. Stables; Sgt. J. H. Stuart-Ritson; F/O. F. S. A. Thomas; Sgt. G. T. Thorley; Sgt. A. J. D. Wares; Flt. Lt. F. Watson, D.F.C.; Flt Sgt. K. White; W/O. F. Wilkinson; Flt. Lt. R. G. Young.

DIED ON ACTIVE SERVICE.—L.A/C. G. Fender; Flt. Lt. E. G. Hollis; W/O. F. C. Opie; Cpl. W. J. Reid; L.A/C. C. Simmons.

PRESUMED DIED WHILST PRISONER OF WAR.—Flt. Sgt. F. E. Reed.

FLOATING BASE: A S.E.A.C. high-speed rescue launch is seen alongside its parent-ship. These parent-ships are self-supporting for 3 months, carrying water, food and medical supplies for that period. Skippers and crews live aboard the "Flats" as they are called.

Royal Australian Air Force

KILLED IN ACTION.—Flt. Sgt. R. F. Barnett; Flt. Sgt. R. E. Davey; W/O. E. W. Hemsworth; W/O. G. Torr.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. F. R. Lamond.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. R. Allen; Flt. Sgt. N. D. Campbell; F/O. M. W. Carroll, D.F.C.; Act. F/O. P. B. Dennett; F/O. I. Fotheringham; W/O. H. E. Gilmour; F/O. H. R. Harrison; F/O. F. G. Jackson, D.F.C.; Act. Sqn. Ldr. E. G. D. Jarman, D.F.C.; Flt. Sgt. S. Mills; W/O. J. A. Murphy; F/O. R. L. Neal; W/O. J. B. Osborn; Flt. Sgt. J. E. Osborne; Flt. Sgt. N. A. Pardon; F/O. C. A. Phillips; P/O F. J. Pottinger; W/O. G. R. N. Wood.

WOUNDED OR INJURED IN ACTION.—Flt. Lt. G. R. Grinter.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Sgt. A. C. Innes.

MISSING.—P/O. P. J. Buckman; F/O. J. M. Johnston; F/O. H. J. A. McLean; P/O. S. W. Neilson; Act. F/O. W. N. R. Pearce; Flt. Sgt. B. M. Trowbridge.

Royal Canadian Air Force

KILLED IN ACTION.—Sqn. Ldr. J. D. Armstrong; P/O. R. O. Battler; Flt. Sgt. L. Boardman; Flt. Sgt. A. G. Caldwell; Flt. Lt. J. G. Clothier; W/O. A. G. Cole; F/O. W. N. Dewitt; F/O. D. A. Fawthrop; Flt. Sgt. J. E. Fielder; P/O. W. Gaba; Flt. Sgt. P. F. Gcnroski; Flt. Sgt. J. E. Hanley; Flt. Lt. G. R. Harris; F/O. C. M. Hay, D.S.O.; Sqn. Ldr. E. A. Hayes; F/O. G. J. Hollinger; P/O. E. S. Kaechele; Sgt. J. A. S. King; F/O. S. I. Lees; Flt. Sgt. F. R. Leet; P/O. A. S. Leroux; P/O. J. P. Nault; P/O. M. B. Nielsen; P/O. G. M. Orser; P/O. N. R. Poole; P/O. H. N. Prince; F/O. C. L. Reitlo; P/O. J. D. Ringrose; Flt. Lt. M. W. Sanderson; F/O. R. G. Smith; P/O. R. F. Sollie; P/O. W. R. Strand; F/O. W. E. Whyte.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—W/O. G. E. Cooper; F/O. G. Korski; Sgt. F. T. Mabee.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. J. F. Allen; W/O. J. E. Allen; P/O. F. R. Alleyn; P/O. G. H. Bainbridge; P/O. J. B. Bell; P/O. K. H. Bennett; P/O. G. R. Berkey; P/O. J. P. R. Boileau; Flt. Sgt. G. J. Byers; Flt. Lt. K. E. Cullen; P/O. J. L. A. Champoux; W/O. F. R. Christenson; F/O. J. Craig; Flt. Sgt. C. A. Davis; P/O. A. H. Death; W/O. F. B. Dennis; Flt. Sgt. P. Dmytruk; F/O. P. Elfner; P/O. C. Grant; F/O. D. W. Hammond; P/O. F. Hatchman; P/O. W. H. O. Heidman; P/O. A. Hinscliffe; F/O. G. E. Holly; P/O. D. A. P. Ledrew; F/O. N. A. Loranger; P/O. J. R. McClelland; Flt. Sgt. T. R. McDennon; Flt. Lt. D. W. McKay; P/O. M. A. McKenzie; F/O. L. E. Mason; P/O. A. D. Maw; F/O. F. H. Mills; P/O. H. R. Moncrieff; P/O. A. B. Moore; P/O. T. J. Moran; P/O. A. M. G. Munro; F/O. K. R. Munro; Flt. Sgt. C. R. Newell; P/O. W. R. Oliver; Flt. Sgt. W. J. Olmsted; W/O. J. M. Potter; P/O. J. H. Price; F/O. W. Quanstrom; F/O. A. S. Redmonds; Sgt. W. F. Reid; P/O. R. A. Saltzberry; F/O. A. B. Schultz; F/O. G. A. Smith; P/O. L. H Smith; P/O. G. D. Spearman; W/O. J. L. Stubbs; Flt. Sgt. R. F. Stubelt; W/O. F. A. Thompson; F/O. A. R. Thrasher; P/O. H. K. Tole; W/O. C. Z. Toupin; F/O. R. L. Weatherall, D.F.M.; P/O. D. F. C. Weeks; Wing Cdr. A. B. Wheeler, D.F.C.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Lt. R. J. Audet, D.F.C.

MISSING.—W/O. H. J. Arnold; P/O. H. L. Ball; F/O. R. W. Donovan; F/O. L. J. R. Gregoire; Flt. Sgt. H. R. Hammerton; W/O. G. W. Lee; W/O. K. L. D. McCoy; Flt. Sgt. J. J. McNeil; F/O. W. B. Mallen; W/O. B. R. Nelson; Flt. Sgt. J. Pennington; P/O. W. J. Phillips; P/O. P. D. Ross-Ross; Flt. Sgt. J. E. Sabine; W/O. M. M. Sandomirsky; P/O. W. W. Webber.

KILLED ON ACTIVE SERVICE.—Flt. Lt. R. A. Haywood.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE—Sgt J. H. MacDougall; Sgt. T. W. Mechefske.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. T. K. Durie; F/O. B. R. J. Hay, D.F.C.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Lt. G. M. Kennedy; Act. Flt. Lt. M. U. Robinson.

MISSING.—Flt. Lt. K. J. Mackenzie; F/O. P. J. Pentelow.

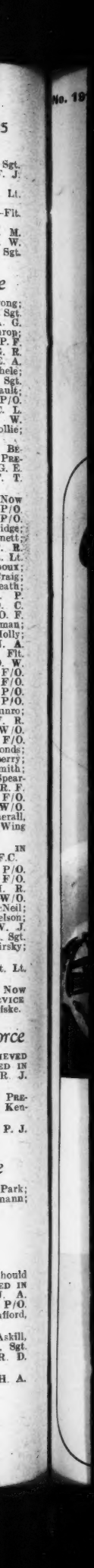
South African Air Force

MISSING.—2/Lt. C. D. Foord; 2/Lt. C. E. Park; W/O. A. R. Thomas; W/O. M. A. Ueckermann; Lt. J. B. Uesson; W/O. R. V. Wilkson.

Official Corrections

Casualty Communiqué No. 531.

The following names under "MISSING" should be transferred to the section headed "KILLED IN ACTION":—Sgt. D. W. S. Bay, Sgt. J. A. Chambers, Sgt. R. J. Dickson, Sgt. L. King, P/O. M. W. Mair, Sgt. N. Russell, Sgt. A. R. Stafford, Sgt. K. R. Still.

Under "MISSING" delete Flt. Sgt. N. D. Askill, F/O. C. J. Day, Sqn. Ldr. D. H. Fenton, Sgt. J. W. Horne, Sgt. D. F. McShane, P/O. R. D. Temple.

S.A.A.F.—Under "MISSING" delete Lt. H. A. Sholto-Douglas.